MATERIALS TOWARD A MONOGRAPH OF THE GENUS VERBENA. XI

Harold N. Moldenke

VERBENA EPHEDROIDES Cham.

Leaves very characteristic, very minute and scale-like, only 1-2 mm. long, acute at the apex, recurved or reflexed, and glabrous, or the lower ones lanceolate, erect, and to 13 mm. long; panicle usually very ample, fastigiate, loose and open; spikes single at the apex of the branchlets or distinctly ternate, pedunculate, 1--2 cm. long, densely flowered, not noticeably elongating after anthesis but sometimes interrupted with a pair of separate flowers at the base, ovate, later narrowly cylindric; pedicels slender, sharply tetragonal, 0.7--3.5 cm. long; bractlets minute, ovate, acute at the apex, 1/3 to 1/2 as long as the calyx, strigillose-canescent; calyx oblong, about 3 mm. long, dark-violet, very obscurely and minutely strigillose-canescent or merely pilosulous, the ribs somewhat prominent, the teeth short-subulate, subequal, in fruit obovate-oblong; corolla-tube scarcely exserted from the calyx, white or else violet from about the middle, noticeably ampliate at the base, very slightly puberulous in the throat, the limb small, violet or lilac to blue, 5-fid, the lobes oblong, truncate or emarginate at the apex; anthers yellowish; fruit about 1.5 mm. long, the cocci narrow, opaque and fuscousnigrescent on the back, obsoletely striate, the commissural face acute-angled and white-leathery.

The type of this species was collected by Friedrich Sellow somewhere in "Brasilia meridionali" and was deposited in the herbarium of the Botanisches Museum at Berlin (and there, fortunately, photographed by Macbride), but now destroyed. The species is closely related to V. alata Sweet and V. lindmanii Briq. Common names recorded for it are "jaqueca", "verbena", and "yerba de Santa Ana". It inhabits fields, wet places, and swamps, and has been collected at altitudes of 350 to 1600 meters, in anthesis

and fruit in January and November.

Herbarium material of this species has been misidentified and distributed under the names V. litoralis Kunth by Widgren, V. litoralis L. by Dusén, and Neosparton ephedroides Griseb. by Ekman. On the other hand, the Claude-Joseph 814, Hutchison 42, and Jergensen 1403, distributed as Verbena ephedroides, are actually Diostea scoparia (Gill. & Hook.) Miers. Verbena virgata Ruíz & Pav. is a synonym of Aloysia virgata (Ruíz & Pav.) A. L. Juss. The Britton sheet of Glaziou 17716 bears a supplementary label reading "17713 Minas", but this is apparently an error since Glaziou, in his formal enumeration of his collections, states that his number 17716 was collected by him in São Paulo and does not list a number 17713 for this species at all. He states that it blooms in March and April, and that the flowers are blue. Curiously, he identifies his no. 17716a as V. perennis Woot., a

species not known to occur in South America. The type of V. virgata Sellow is the same as for V. ephedroides; Sellow's herbarium name (cheironym) was discarded by Chamisso because of the earlier homonym of Ruíz & Pavon. The type of V. valerianoides St.-Hil. was collected by Johan Fredrik Widgren (no. 1207) in Minas Gerais, Brazil, on November 4, 1845, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels.

Briquet (1894) classifies V. ephedroides in his Sect. Verbenaca, Subsect. Junciformes, along with V. alata Sweet, V. sagittalis Cham., Junellia glauca (Gill. & Hook.) Moldenke, J. pseudo-juncea (C. Gay) Moldenke, and J. spathulata (Gill. & Hook.) Moldenke. Walpers (1845) places it in his Sect. Verbenaca, Subsect. Inermes, Group Junceae, along with V. alata and V. sagittalis, Diostea juncea (Gill. & Hook.) Miers and D. scoparia (Gill. & Hook.) Miers, Junellia glauca and J. spathulata, and Neosparton ephedroides Griseb. Schauer (1847, 1851) cites a Bacle s.n. from Montevideo, Uruguay, in either the Berlin or DeCandolle herbarium, not as yet seen by me. He notes "Planta habitu valde insignis".

In all, 17 herbarium specimens and 3 mounted photographs, including type or phototype material of all the names involved, have

been examined by me.

Citations: BRAZIL: Minas Gerais: Widgren 1207 [4/11/1845] (Br), s.n. [1845] (Br). Paraná: Dusén 11083 (S). Rio Grande do Sul: C. Camargo 62960 (S); Jürgens s.n. [Linha Burity, I.1932] (W-1482199); Rambo 30934 (N). Santa Catarina: F. Müller 90 (Ja-46529); Schwacke s.n. [São Bento, 30/VI/1885] (Ja-46585, Ja, N). São Paulo: Glaziou 17716 (B, N); Schwacke s.n. [Mogy das Cruzes, 19/IV/1889] (Ja-46584). State undetermined: Herb. Mus. Nac. Rio ref. XI (Ja, N); Sellow s.n. [Brasilia meridionali; Macbride photos 17415] (Kr--photo of type, N--photo of type, N--photo of type). ARGENTINA: Misiones: Ekman 2023 (Mi, S).

XVERBENA FABRICATA Moldenke, Phytologia 5: 133. 1955.

Synonymy: Verbena hispida x urticifolia Dermen, Cytologia 7: 170. 1936.

Bibliography: Dermen, Cytologia 7: 170. 1936; Moldenke, Phytologia 3: 467 (1951) and 5: 133. 1955; Moldenke, Biol. Abstr. 30: 1093. 1956; Moldenke, Am. Midl. Nat. 59: 348-349. 1958; Moldenke,

Résumé 223, 366, 377, & 471. 1959.

This is an artificially produced hybrid between V. hispida Ruiz & Pav. and V. urticifolia L., produced by Dermen in a Massachusetts garden. The two parent species do not normally grow together anywhere, so it is not probable that this hybrid will ever be found in the wild. It is not likely to possess any horticultural merit either.

VERBENA FASCICULATA Benth., Bot. Voy. Sulph. 153. 1846. Synonymy: Verbena matthewsii Briq., Ann. Conserv. & Jard. Bot. Genèv. 10: 104. 1907. Verbena occidentalis Moldenke, Phytologia 1: 479--480. 1940. Verbena mathewsii Briq., in herb.

Bibliography: Benth., Bot. Voy. Sulph. 153. 1846; Hook. f. & Jacks., Ind. Kew. 2: 1178. 1895; Briq., Ann. Conserv. & Jard. Bot. Genèv. 10: 104. 1907; Prain, Ind. Kew. Suppl. 4: 245. 1913; Moldenke, Phytologia 1: 479-480 (1940) and 1: 511. 1941; Moldenke, Suppl. List Invalid Names 9. 1941; Moldenke, Alph. List Invalid Names 49. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 35 & 101. 1942; Hill & Salisb., Ind. Kew. Suppl. 10: 242 1947; Moldenke, Phytologia 2: 235. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 71. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 73 & 198. 1949; Moldenke, Alph. List Cit. 3: 693, 713, & 766. 1949; Moldenke, Phytologia 3: 286. 1950; Moldenke, Résumé 85, 370, 471, & 472. 1959; Moldenke, Résumé Suppl. 3: 13. 1962.

85, 370, 471, & 472. 1959; Moldenke, Résumé Suppl. 3: 13. 1962. Tall and vigorous perennial, very hirsute, apparently droughtresistant herb, sometimes 2 feet tall, often rambling over the ground, the stems and leaves with the aspect of Castilleja species; stems robust, often erect, apparently woody at the base, sometimes decumbent, ramose, obtusely 4-angled, spreading-pilose or densely hirsute-pubescent throughout, with some shorter sordid-grayish stipitate glands intermixed, apparently somewhat branched or simple; branches erect or ascending, 15--31 cm. tall, very hirsute; middle cauline internodes 1.5--4 cm. long; leaves decussate-opposite, very short-petiolate or subsessile to plainly sessile, the young ones fasciculate in the axils; petioles, when present, very short and winged; leaf-blades chartaceous, uniformly gray- or ashy-green on both surfaces, about 4 cm. long, softly spreading-pilose or densely hirsutulous-pubescent on both surfaces with grayish hairs like those on the stems, sometimes substrigose above, deeply 3--5-parted or -dissected to the base in an almost verticillate fashion, the segments rather deeply incised-crenate or pinnatifid, scarcely 0.5 mm. wide, the primary incisions to 3.5-5 cm. long, the lobules about 4 mm. wide, obtuse or subobtuse, somewhat revolute along the margins, the rest smaller and much narrower, lanceolate or linear, acute, entire or 3--5-fid; midrib and secondaries very slender, impressed above, prominulous beneath; veinlet reticulation indiscernible on both surfaces or prominulous beneath; spikes terminal, single, simple, sessile or short-pedunculate, unbranched, 7--8 cm. long, elongate during anthesis, very densely many-flowered, the floriferous part about 2.5 cm. long and 1.5 cm. wide, shorter than in V. canadensis but otherwise similar; peduncles slender, about 3.5 cm. long, densely hirsute-pubescent like the stems; flowers sweetsmelling, very densely imbricate (except the lowest 2 or 3, which may be arranged in a whorl somewhat separated from the rest of the spike) or more separated so as to be barely imbricate and somewhat divergent in fruit; bractlets large, linear to narrowlanceolate or lanceolate-subulate, 5--8 mm. long, less than 1 mm. wide, acuminate at the apex, equaling or somewhat surpassing the calyx during anthesis, densely hirsutulous with gland-tipped hairs like the peduncles or antrorsely pilose, similar to those of

V. canadensis; calyx oblong-elongate or tubular, 7--8 mm. long and 2 mm. wide during anthesis, similar to that of V. canadensis, its tube about 5 mm. long, 5-costate, 5-angled, hirtous or densely hirsutulous to antrorsely pubescent, with small, spreading, whitish glands intermixed among the hairs, very thin-textured between the ribs, its rim 5-apiculate, the teeth lanceolate-acuminate or setaceous, about 2 mm. long; corolla hypocrateriform, varying from lavender or purple to deep- or dark-purple, smaller than that of V. canadensis, its tube about 10 mm. long, surpassing the calyx-teeth by 2--3 mm., the limb medium-sized, about 5 mm. wide, puberulent on the outer surface, the lobes obovate-truncatulate, subemarginate; stamens and pistil barely equaling the mouth of the corolla-tube; anther-glands small; anther-cells distinct, rather broad; upper lobe of the style very snort, thickly pulvinate-stigmatic, the lower short but surpassing the pulvinus, incurved-acute, naked; cocci oblong, splitting spontaneously at maturity, rugose above with an elevated reticulation of veins; testa very slender, membranous; endosperm very sparse, but apparently present.

The type of this species was collected at Huamantango, Lima, Peru, and has not as yet been seen by me. It is preserved in the herbarium of the Royal Botanic Gardens at Kew. However, my good friend, Edgar Milne-Redhead, in a letter to me dated February 12, 1963, asserts that "We find that we cannot distinguish V. mathewsii Briq. from V. fasciculata Bth., and regard it as a taxonomic synonym. The type locality of both was in the same region of Huarochiri." Bentham notes that the species is related to V. canadensis (L.) Britton, but is more hirsute and has different leaves. He says that it is perhaps suffruticose and that Cuming 95h, from the coast of Peru, seems to be the same species, with rather blunter

lobes to the leaves.

The type of V. occidentalis was collected by Andrew Mathews (no. 498) somewhere in Peru in 1834, and is deposited in the Meisner Herbarium at the New York Botanical Garden, while that of V. matthewsii is given by Briquet as "no. 495" from the environs of Lima, Peru, deposited in the Delessert Herbarium at Geneva. It is also given as "495" on the labels of Macbride's photograph of the type specimen, but this appears to be an error in reading in both cases. The original specimen seems to be a part of the same 498 collection. Also, the collector's surname should be spelled with a single "t" according to the late Dr. J. H. Barnhart. Most of the records in botanical literature concerning this man spell the name with one "t", including the Kew list of collectors, the British Museum list of collectors, the list of British and Irish botanists, the London catalogue of scientific literature, and his own writings in the publications of the Horticultural Society. Only the Linnean Society and one Journal of Botany obituary spell the name with a double "t", and there his first name is given as "Alexander" instead of "Andrew".

The species has been found in dry clay or clayey soil, sandy

loam, stony habitats, hot and dry rocky hillsides, and puna, from 550 to 3900 meters altitude, flowering from February to April and in October and December. Herbarium material has been misidentified and distributed as V. laciniata (L.) Briq. Tovar 1351 is said by the collector to have had whitish flowers and may therefore represent a color form worthy of special designation.

Briquet says "Espèce voisine des V. clavata Ruiz et Pav., V. sulfurea Sweet, V. Berterii Schau., V. lipozygioides Walp. etc. Toutes ces espèces ont des tiges procumbantes, sortant d'un rhizome ou d'une base ligneuse et ont un port complètement différent. Toutes aussi ont des bractées bien plus courtes que le calice. Le V. clavata Ruiz et Pav., qui par la longueur des bractées se rapprocherait du V. Matthewsii, possede des feuilles entièrement tripartites a segments lineares pseudo-verticilles, des apis sessiles involucres, des appendices antheriens saillants, des lobes corollins lineares-oblongs, caractères qui permettent facilement de l'en distinguer."

In all, 13 herbarium specimens, including the type collections of three of the names involved, and 2 mounted photographs have

been examined by me.

Citations: PERU: Ancash: Ferreyra & Cerrate 12191 (Ok). Ayacucho: R. Ferreyra 5470 (N, Ug). Cajamarca: Stork & Horton 10032 (Ca-639346). Huancavelica: Tovar 1351 (Z). Lima: R. Ferreyra 1980 (N); Mathews 498 ["495"; Macbride photos 24691] (Kr-photo, M, N-photo); S. G. E. Saunders 797 (S), 799 (S); Stork & Vargas 9341 (Ca-647436). Loreto: Née 99 (Q). Province undetermined: Mathews s.n. [in Peruvia interiore, 1862] (M); Née 98 (Q).

XVERBENA FECUNDA Moldenke, Am. Midl. Nat. 59: 349. 1958.

Synonymy: Verbena canadensis x ambrosifolia f. eglandulosa

Dermen, Cytologia 7: 168, in textu. 1936; Moldenke, Résumé 360,
in syn. 1959. Verbena canadensis var. atroviolacea x ambrosifolia
f. eglandulosa Dermen, Cytologia 7: 168, in textu. 1936; Moldenke, Résumé 360, in syn. 1959. Verbena canadensis var. compacta x
ambrosifolia f. eglandulosa Dermen, Cytologia 7: 168, in textu.

1936; Moldenke, Résumé 360, in syn. 1959. Verbena canadensis var.
compacta Hort. x V.ambrosifolia f. eglandulosa Dermen ex Moldenke,
Résumé 421. in nota. 1959.

Bibliography: Dermen, Cytologia 7: 168. 1936; Moldenke, Am. Midl. Nat. 59: 349. July 1958; Moldenke, Phytologia 6: 330. August 1958; Moldenke, Résumé 359, 360, 421, & 471. 1959; Moldenke, Résum

mé Suppl. 1: 15 (1959) and 3: 37. 1962.

Under this name are included the fertile hybrids produced artificially in Massachusetts by Dermen between V. canadensis (L.)
Britton [including V. canadensis var. atroviolacea Hort. and V. canadensis var. compacta Hort.] and V. ambrosifolia f. eglandulosa Perry. These two parental taxa apparently grow together in at least two counties of Texas, so it is possible that the hybrid

will be found in the wild state. It should have horticultural merit and deserves further study.

XVERBENA FERAX Moldenke, Am. Midl. Nat. 59: 349. 1958.

Synonymy: Verbena canadensis x racemosa Dermen, Cytologia 7: 168. 1936. Verbena canadensis var. atroviolacea x racemosa Dermen, Cytologia 7: 168. 1936. Verbena canadensis var. compacta x racemosa Dermen, Cytologia 7: 168. 1936.

Bibliography: Dermen, Cytologia 7: 168. 1936; Moldenke, Am. Midl. Nat. 59: 349. July 1958; Moldenke, Phytologia 6: 330. August 1958; Moldenke, Résumé 360, 373, & 471. 1959; Moldenke, Résumé

Suppl. 1: 15. 1959.

Under this name are included the fertile hybrids produced artificially in Massachusetts by Dermen between V. canadensis (L.)
Britton [including V. canadensis var. atroviolacea Hort. and V. canadensis var. compacta Hort.] and V. racemosa Eggert. These two species apparently grow together in at least two counties of Texas, so there is a distinct possibility that the hybrid may be found in the wild state. It may have horticultural merit and deserves further study.

VERBENA FERREYRAE Moldenke, Phytologia 3: 279. 1950.

Bibliography: Moldenke, Phytologia 3: 279 & 286. 1950; E. J. Salisb., Ind. Kew. Suppl. 11: 263. 1953; Moldenke, Résumé 85 & 471. 1959.

Herb; stems and branches erect or ascending, obtusely tetragonal, brunnescent in drying, rather sparsely puberulent with weak, irregular, whitish hairs, the former rather stoutish, the latter quite slender; nodes annulate; principal internodes 2-6.3 cm. long; leaves decussate-opposite, sessile, uniformly brightgreen on both surfaces, the immature ones often brunnescent in drying, 3-parted almost to the base, 3--6 cm. long and wide, the 3 divisions again pinnately parted and incised, the lobes rather thick and acute, the segments irregular in diameter, usually increasing in diameter toward the leaf-base and there often to 8 mm. wide, revolute-margined, rather sparsely puberulent-pilosulous above, becoming glabrescent in age, more densely puberulent beneath, the single vein in each segment mostly subimpressed above and prominulous beneath, extending to the apex of each lobe; inflorescence terminal, that at the apex of the main stems usually ternate, spicate, densely many-flowered; peduncles slender, 1.5--4 cm. long, densely short-pubescent with reflexed whitish hairs; floriferous portion of the inflorescence usually conic before anthesis, capitate during anthesis, and elongate to 4 cm. or more after anthesis, very dense; bractlets oblong-linear, 6--8 mm. long, rather densely puberulent; calyx tubular, about 6 mm. long, 5-costate, rather densely short-pubescent, its rim 5-apiculate; corolla hypocrateriform, sky-blue, its tube about 8 mm. long, the limb about 9 mm. in diameter, densely pilose in the throat.

The type of this species was collected by my good friend and

colleague, Dr. Ramón Ferreyra (no. 5491) -- in whose honor it is named -- in a stony habitat, at 3200 to 3300 meters altitude, above Puquio, in the province of Lucanas, Ayacucho, Peru, on March 19, 1949, and is deposited in the Britton Herbarium at the New York Botanical Garden. The species is known so far only from the type collection, and 2 herbarium specimens, including the type, have been examined by me.

Citations: PERU: Ayacucho: R. Ferreyra 5491 (N--type, Ug--

isotype).

VERBENA FILICAULIS Schau. in A. DC., Prodr. 11: 549. 1847.
Symonymy: Verbena pinnatisecta Schau. in A. DC., Prodr. 11:

549. 1847. Bibliography: Schau. in A. DC., Prodr. 11: 549 & 556. 1847; Schau. in Mart., Fl. Bras. 9: 192. 1851; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 148. 1894; Jacks., Ind. Kew. 2: 1178. 1895; Hayek, Denkschr. Kaiser. Akad. Wiss. Math.-nat. 79 (1): 294. 1908; Herter, Florul. Urug. 105. 1930; Herter, Revist. Sudam. Bot. 4: 186. 1937; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39, 44, & 101. 1942; Moldenke, Lilloa 10: 384. 1944; Augusto, Fl. Rio Grande do Sul 212. 1946; Moldenke, Alph. List Cit. 1: 56, 166, & 177. 1946; Moldenke, Castanea 13: 117. 1948; Moldenke, Alph. List Cit. 2: 363, 364, 366, 367, 375, 534, 550, 551, & 598 (1948), 3: 670, 675, 686, 688, 751, 814, 846, 863, 920, & 923 (1949), and 4: 1081, 1097, 1123, 1124, 1180, 1222, 1249, & 1250. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 94, 106, & 198. 1949; Moldenke, Phytologia 3: 288. 1950; Stellfeld, Trib. Farmac. 19 (10): 166 & 167. 1951; Rambo,

Sellowia 7: 260. 1956; Angely, Fl. Paran. 7: 12. 1957; Moldenke, Résumé 110, 127, 372, & 471. 1959; Angely, Fl. Paran. 16: 78 (1960) and 61: 46. 1961.

Mostly procumbent herb, smooth and glabrous or strigillosescabrous throughout; rhizome creeping, giving rise to numerous stems; stems herbaceous, strict, often ascending from the base and 30--40 cm. long, filiform, often weak or flaccid, subsimple, tetragonal or subtetragonal; principal internodes longer or shorter than the leaves; petioles elongate, slender, canaliculate, submargined, the lower ones 1.6--2 cm. long, the upper ones slightly shorter; leaf-blades thick-textured, diminishing in size upwards, 3-partite, pinnatifid-laciniate, shiny above, dark beneath, the segments cuneate-attenuate at the base, the venation impressed above, prominent beneath, the lowermost lobes cuneately narrowed at the base into the petiole, about 1.2 cm. long, the lateral lobes subspatulate-linear or narrowly lanceolate, acute or rather obtuse at the apex, entire or bifid, subrevolute or revolute along the margins, the central lobe trifid; inflorescence terminal and lateral, the spikes pedunculate or long-pedunculate, the terminal ones single and simple or ternate, the lateral ones again ternate or ternate-corymbose, cylindricoblong, loose-flowered or imbricate, not very many-flowered, eventually to 4 cm. long, interrupted at the base, finally with scattered flowers; bractlets ovate, concave, about half as long

as the calyx, acute at the apex, obsoletely ciliate; calyx short, tubular, about 3 mm. long, subcostate, the rim short-dentate, very finely ciliate, the teeth broadly triangular and acute or apiculate at the apex; corolla varying from blue or red-blue to violet, lilac, or red, glabrous on the outside, its tube somewhat surpassing the calyx, the throat closed by dense barbate hairs, the limb velutinous, lanuginous in the center; stamens inserted in the upper part of the corolla-tube; filaments very short; anthers muticous, the connective of the upper ones hardly thickened; style scarcely surpassing the calyx, incrassate above; stigma subterminal, forming a very short lateral capitate beak; fruit subequaling and included by the fruiting-calyx, about 3 mm. long; cocci terete, fuscous, obsoletely striate on the dorsal surface and areolate at the apex, the commissural face whitish-leathery.

V. pinnatisecta is based on a collection made by Ludwig Riedel in wet swampy places at or near Mugy das Cruces, São Paulo, Brazil, and one made by Friedrich Sellow (no. 20) probably in Minas Gerais, Brazil, while V. filicaulis was based on a collection made by Peter Wilhelm Lund (no. 823) in São Paulo, one by Sellow (no. 28) in Minas Gerais, and one by Johan Lhotsky ["Khotsky" according to Schauer] in Minas Gerais. Schauer distinguishes the two by saying for V. filicaulis: "Proxima V. pinnatisectae, potissimum teneritate partium, scilicet caulibus debilibus foliisque minus dissecta laciniis angustioribus, diversa." Personally, I think that they are conspecific. Schauer also suggests that his V. pinnatisecta might be the same as V. crithmifolia Gill. & Hook. ["quae vero ex descr. differt foliorum laciniis angustioribus linearibus, bracteis linearibus, calycis dentibus obtusiusculis et corolla calyce duplo longiore"] and that his V. filicaulis might be the same as V. crithmifolia & minor Gill. & Hook. [=V. hookeriana (Covas & Schnack) Moldenke], which he apparently knew only from the descriptions. These species, however, as all very distinct from that of Schauer.

Verbena filicaulis has been collected in swamps and swampy places, wet grassy campos, bogs, and meadows, on often inundated riverbanks, in fields and bare soil along railroad tracks, and in pinewoods with Butia, at altitudes of 90 to 1400 meters, flowering in May and August to January. Briquet (1894) places it in his Sect. Verbenaca, Subsect. Leptostachyae. Hoehne says of it "planta meio rasteira" and Pickel says "em solo humido da represa". What Schauer means by his "caules...lateralibus foliis alternis subexcavatis, foliis subjectis planiusculis submarginatis et subliter striatis" is not certain. Herbarium material has been misidentified and distributed as V. tenuisecta Briq. On the other hand, the Dusén 7108, distributed as V. pinnatisecta, is the type collection of V. dusenii Moldenke.

Hayek (1908) cites Wettstein & Schiffner s.n. [Butantan, V. 1901] and s.n. [Tieté, VIII.1901] from São Paulo, while Stellfeld

(1951) cites two additional Tessman and one Stellfeld collections from Paraná -- Herb. Mus. Paran. 2232, 2447, and 2527. Macbride photograph 17439, cited below, is of a specimen deposited in the Berlin herbarium, now destroyed.

In all, 67 herbarium specimens and 9 photographs, including type or phototype material of both names involved, have been ex-

amined by me.

Citations: BRAZIL: Minas Gerais: Henschen s.n. [Caldas, 23/10/ 1868] (W--209655); Mosén 969 (N, S); Regnell II.211 [17/11/1866] (N), II.211 [Caldas, Oct. 23, 1868] (N, S); Sellow 20 [Macbride photos 17439] (Kr--photo, Kr--photo, N--photo, N--photo, N--photo), 28 (N--cotype, N--photo of cotype, Ut--cotype, Z--photo of cotype); Widgren 870 [1845] (W-1323092), 1210 (Br), s.n. [1845] (Br, Ja--46590, N, S), s.n. [Brasilia] (S, S). Paraná: Dusén 7106 (S, S), 15679 (Ca--501671, N, S, S, W--1481764); Hatschbach 2561 (N), 2672 (N); Jonsson 1392a (N, S, W-1481765); Smith, Reitz, & Caldato 9568 (Ok, W--2251567); Tessman s.n. [Herb. Mus. Paran. 3395] (N). Rio Grande do Sul: Rambo 35413 (N), 36413 (S), 54571 (B), 57237 (S). Santa Catarina: F. Muller 94 (Ja--46532); Reitz & Klein 7711 (Mm), 7738 [Herb. Barb. Rodr. 22662] (Mm, N, S); Smith & Klein 11041 (N. Ok. W--2251746), 11404 (Ok, W--2251778); Smith & Reitz 9122 (Ok, W--2251493); Smith, Reitz, & Sufridini 9544 (W-2251563, Z); Ule 1536 [Herb. Osten 13014] (Ug). São Paulo: Brade 5738 (Ja--22884, S, Sp--6726); C. Duarte 196 (N, Sp--15723); Ed-Wall s.n. [Agua Branca, Aug. 5, 1895; Herb. Com. Geogr. & Geol. 3127] (Sp-15718); F. C. Hoehne s.n. [Butantan, Sept. 15, 1917] (N, N, Sp--543); W. Hoehne 527 (N); Lofgren s.n. [Pinheiros, Nov. 2, 1893; Herb. Com. Geogr. & Geol. 1560] (N, Sp-15713); Lund 823 [Macbride photos 7854] (Kr--photo of cotype, N--photo of cotype); Pickel 1759 (N, Sf); Usteri s.n. [Tieté, 1905] (N, Sp-15735). ARGENTINA: Misiones: D. Rodriguez 570 [Herb. Inst. Miguel Lillo 31548] (N).

VERBENA FLAVA Gill. & Hook. in Hook., Bot. Misc. 1: 170. 1830.

Synonymy: Verbena flava Gill. ex Reiche, Fl. Chile 5: 463.

1910. Glandularia flava (Gill. & Hook.) Schnack & Covas, Darwin-

iana 6: 475. 1944.

Bibliography: Hook., Bot. Misc. 1: 170. 1830; Walp., Repert.
Syst. Bot. 4: 30. 1845; Schau. in A. DC., Prodr. 11: 555. 1847;
Jacks., Ind. Kew. 2: 1178. 1895; Speg., Rev. Agron. La Plata 3:
563. 1897; Kuntze, Rev. Gen. Pl. 3 (2): 255. 1898; Reiche, Fl.
Chile 5: 295 & 463. 1910; Hauman-Werck, Anal. Mus. Argent. Hist.
Nat. Buenos Aires 24: 413. 1913; Hicken, Physis 2: 114. 1916;
Sanzin, Anal. Soc. Cient. Argent. 88: 97, 98, 124--127, & 134.
1919; Stapf, Ind. Lond. 6: 429. 1931; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 44 & 101. 1942; Schnack & Covas, Darwiniana 6: 471, 473, & 475 (1944) and 7: 71, 72, 74, & 75, pl. 4.
1945; Schnack & Covas, Revist. Argent. Agron. 12: 222. 1945; Ind.

Taxon. 1 (14-16): 6. 1945; Cabrera, Bol. Arg. Soc. Bot. 1: 67. 1945; Moldenke, Alph. List Cit. 1: 93 & 202. 1946; Moldenke, Phytologia 2: 338. 1947; Moldenke, Alph. List Invalid Names Suppl. 1: 10 & 24. 1947; Moldenke, Alph. List Cit. 3: 881. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 106 & 198. 1949; E. J. Salisb., Ind. Kew. Suppl. 11: 101. 1953; Moldenke, Résumé 127, 296, 364, & 471. 1959; Moldenke, Résumé Suppl. 3: 14. 1962.

Illustrations: Sanzin, Anal. Soc. Cient. Argent. 88: 126. 1919;

Schnack & Covas, Darwiniana 7: pl. 4. 1945.

Stems procumbent at the base; leaves linear-lanceolate, entire, pinnatifid, glabrous, the segments few, linear, trifid, entire; flowers loosely spicate; calyx elongate, pubescent, the teeth very unequal; bractlets minute; corolla yellow or pale-yellow to

rose, glutinous; chromosome number: 2n = 10.

This Andean species was based on two collections made by John Gillies in the Andean valleys near Mendoza and on the hills at Rio del Diamente, Mendoza, Argentina. Walpers (1845) places it in his Section Verbenaca, Subsection Inermes, Group Foliosae, Subgroup Macranthae, and Secondary Subgroup Aubletia, with ten other species. It has been collected in sandy places at altitudes of 250 to 1600 meters, flowering from November to May and in September, fruiting in November. Sanzin reports it as "common on Pampa San Rafael". Hicken (1916) reports it from Neuquen. Herbarium material has been misidentified and distributed as V. glutinosa Kuntze. On the other hand, the H. H. Bartlett 19410, distributed as V. flava, is actually V. chilensis Moldenke. Ruiz Leal 13088 bears a notation to the effect that the flowers vary from "yellow to rose", perhaps due to age. In all, 22 herbarium specimens have been examined by me.

Citations: ARGENTINA: Chubut: Graetel s.n. (Br). Mendoza:

Carette 339, in part (N), s.n. [Ruiz Leal 2558] (N); Ruiz Leal

6913 (N), 7093b (N), 7117 (N), 7349 (N), 8503 (N), 8960 (N), 9291

(N, N), 9790 (N), 13088 (Z); Sanzin 3104 [Herb. Osten 15637]

(Ug). Rio Negro: W. Fischer 59 (Cm, N, Ur, W-704229, W-704230).

Province undetermined: Kuntze s.n. [Pampas Reise 35° I.92] (N, W-

701714, W-701715).

VERBENA FLAVA var. ANGUSTILOBA Speg., Anal. Soc. Cient. Argent.
53: 249 [Nov. Add. Fl. Patag. 2: repr. 72]. 1902.
Synonymy: Verbena flava angustiloha Speg. or Woldenke Résumé

Symonymy: Verbena flava angustiloba Speg. ex Moldenke, Résumé

364, in syn. 1959.

Bibliography: Speg., Anal. Soc. Cient. Argent. 53: 249 [Nov. Add. Fl. Patag. 2: repr. 72]. 1902; Hauman-Merck, Anal. Mus. Argent. Hist. Nat. Buenos Aires 24: 413. 1913; Sanzin, Anal. Soc. Cient. Argent. 88: 127. 1919; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 44 & 101 (1942) and [ed. 2], 106 & 198. 1949; Moldenke, Résumé 127, 364, & 471. 1959.

This variety differs from the typical form of the species in having its branches elongate and slender, the lower leaves tri-

partite with linear segments, the upper ones entire, with elongate narrowly linear segments, the corolla yellow, its throat glabrous, and the anther-glands dark-purple and exserted.

The type of the variety was collected by Carlo Luigi Spegazzini in dry places along the Rio Negro at El Carbon near Carmen de Patagones, Rio Negro, Argentina, during the summer of 1897 to 1898. Hauman-Merck (1913) cites a Garbers specimen from Choele-Choel, Rio Negro [Hauman-Merck 343]. The variety is known to me only from literature.

VERBENA FLAVA var. LATILOBA Speg., Anal. Soc. Cient. Argent. 53: 249 [Nov. Add. Fl. Patag. 2: repr. 72]. 1902.

Synonymy: Verbena flava latiloba Speg. ex Moldenke, Résumé

364, in syn. 1959.

Bibliography: Speg., Anal. Soc. Cient. Argent. 53: 249 [Nov. Add. Fl. Patag. 2: repr. 72]. 1902; Hicken, Physis 1: [Canist. Neuquen.] 127. 1912; Sanzin, Anal. Soc. Cient. Argent. 88: 127. 1919; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 44 & 101 (1942) and [ed. 2], 106 & 198. 1949; Moldenke, Résumé 127, 364, & 471. 1959; Moldenke, Résumé Suppl. 3: 14. 1962.

This variety differs from the typical form of the species in having the leaves completely glabrous, rather thickly membranous, green or slightly subglaucescent, and all 3-parted or trifid, with ovate lobes, the flowers yellow, the throat glabrous, and the two anther-glands large, dark-purple, and quite conspicuous.

The variety is based on two collections, one made by Nicolás Illin and the other by J. Kozlowsky, in the dry pre-Andean region in Chubut, Argentina, in the summer of 1899 to 1900. Hicken (1912) says of the variety "Frecuente cerca de los arroyos. Cordilleras del Chub." It is known to me only from literature.

VERBENA FLAVA var. LATILOBA f. ABORTIVA Hicken, Sert. And. 65.

Bibliography: Hicken, Sert. And. 65. 1923; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 44 & 101 (1942) and [ed. 2], 106 & 198. 1949; Moldenke, Résumé 127 & 471. 1959.

This form differs from the typical form of the variety in having its anther-glands very minute, not at all conspicuous. The leaves are almost all pinnatifid, rarely with a few entire

The type of the form was collected by Cristobal María Hicken (no. 135) at Arroyo Morro, on the Río Diamente, at an altitude of 2000 meters, Mendoza, Argentina, in December, 1912. The collector says "Las glandulás abortan y se presentan como un pequeñismo apéndice dorsal a las anteras, muy difícil de ver, y que podría por esta causa pasar desapercibido y hacer creer en una planta del grupo de Verbenaca. Las hojas casi todas son pinatifidas y er raro incontrar una u otra hoja pecueña sencilla en las partes superiores de los tallos." The form is known to me only from literature.

VERBENA GALAPAGOSENSIS Moldenke, Phytologia 2: 55. 1941.

Bibliography: Moldenke, Phytologia 2: 55. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 34 & 101. 1942; Moldenke, Castanea 13: 116. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 71 & 198. 1949; Moldenke, Alph. List Cit. 3: 972. 1949; E. J. Salisb., Ind. Kew. Suppl. 11: 263. 1953; Moldenke, Résumé 81 & 471. 1959.

Herb, nigrescent throughout in drying; stems and branches slender, acutely tetragonal, often sulcate and striate between the angles, very sparsely pilose with short whitish widely scattered antrorse hairs; nodes annulate; principal internodes 1--5.8 cm. long; leaves decussate-opposite, sessile, sub-clasping at the base, linear or very narrowly lanceolate, 5--15 mm. long, rather abundantly pilose with appressed antrorse hairs on both surfaces; midrib and veinlet reticulation indiscernible; inflorescence terminal, spicate, 4--15 cm. long, loosely many-flowered; peduncles slender, similar to the branches in all respects, nigrescent in drying, acutely tetragonal, longitudinally striate, very sparsely scattered-pilose, 1--3 cm. long; bractlets ovate-lanceolate, about 2.5 cm. long, ciliolate-margined, acuminate at the apex, usually glabrate or very obscurely pilosulous except for the margins; mature flowers and fruit not known.

The type of this remarkable species was collected by Alban Stewart (no. 3318) at Cowley Bay, Albemarle Island, in the Galapagos Islands, on August 10, 1905, and is deposited in the Britton Herbarium at the New York Botanical Garden. The collector states that the species is common at 2000 feet elevation and fairly abundant "inside 2750 feet", apparently flowering and fruiting in August, although the material collected is not sufficient to enable accurate description of these parts. It has been confused in the past with V. litoralis H.B.K. In all, 6 herbarium specimens, including the type, and 4 mounted photographs have been examined by me.

Citations: GALAPAGOS ISLANDS: Albemarle: A. Stewart 3318 (Bi-isotype, F-photo of isotype, Gg-31374--isotype, N--type, N--photo of isotype, Si--photo of isotype, Z--photo of isotype), 3319 (Bi, Gg-31373, W-921598).

VERBENA GENTRYI Moldenke, Phytologia 2: 27. 1941.

Bibliography: Moldenke, Phytologia 2: 27. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 18 & 101. 1942; Moldenke, Alph. List Cit. 1: 233. 1946; H. N. & A. L. Moldenke, Pl. Life 2: 60. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 33 & 198. 1949; Moldenke, Alph. List Cit. 4: 1246. 1949; E. J. Salisb., Ind. Kew. Suppl. 11: 263. 1953; Moldenke, Résumé 39 & 471. 1959.

Low spreading bush, branched from the base; branches rather slender, tetragonal, often purplish, very sparsely scattered-pilose with rather long weak hairs or glabrous; nodes annulate; principal internodes 1--3.5 cm. long; leaves decussate-opposite; petioles indistinct, to 5 mm. long, winged, ampliate and clasping

the stem at their base, sparsely scattered-pilose or glabrescent, or absent; leaf-blades chartaceous, lighter beneath, elliptic, 3-7 cm. long, 1-1.7 cm. wide, acute at the apex, cuneate at the base and prolonged into the winged petiole, regularly sharpserrate from the apex to below the middle, rather abundantly appressed-strigillose on both surfaces, more densely so beneath, not scabrous above, not glandular; venation slightly subimpressed above, prominulous beneath; inflorescence spicate, compound, the spikes very slender, to 19 or more cm. long, many-flowered, the flowers closely imbricate before and during anthesis, rather uniformly separated in fruit; peduncles 1--3 cm. long, slender, glabrate; rachis slender, glabrate; bractlets lanceolate, very small, about 1--2 mm. long, sharply acuminate at the apex, subglabrate or very minutely ciliolate at the base; calyx narrowtubular, about 1.5 mm. long, glabrous or subglabrate; corolla very tiny; fruiting-calyx to 2 mm. long.

The type of this species was collected by Howard Scott Gentry (no. 5923) -- in whose honor it is named -- in a moist canyon bottom in the Short-tree Forest zone, at an altitude of 1500 feet, in the Sierra Monterey, Sinaloa, Mexico, on March 13, 1940, and is deposited in the Britton Herbarium at the New York Botanical Garden. It was distributed by the collector as V. urticifolia L., to which it is related. Thus far it is known only from the type collection. In all, 6 herbarium specimens, including

the type, have been examined by me.

Citations: MEXICO: Sinaloa: H. S. Gentry 5923 (Ca-651815--isotype, Du-285097--isotype, Fs-isotype, Me-isotype, Me-isotype, Me-isotype, Me-isotype, N--type).

VERBENA GLABRATA H.B.K., Now. Gen. & Sp. Pl. 2: 276-277. 1818 [not V. glabrata R. A. Phil., 1870].

Veg., ed. 16, 2: 748. 1825. Verbena glabrata Kunth ex Schau. in A. DC., Prodr. 11: 542, in syn. 1847. Verbena glomerata Hérincq & Gerard in Réveil, Règne Vég. 4: pl. 18. 1870. Verbena glomerata

Auct. ex Stapf, Ind. Lond. 6: 429. 1931.

Bibliography: H.B.K., Nov. Gen. & Sp. Pl. 2: 276-277. 1818; Spreng. in L., Syst. Veg., ed. 16, 2: 748. 1825; Walp., Repert. Syst. Bot. 4: 20. 1845; Schau. in A. DC., Prodr. 11: 542. 1847; Hérincq & Gerard in Réveil, Règne Vég. 4: pl. 18. 1870; Hook. f. & Jacks., Ind. Kew. 2: 1178. 1895; Stapf, Ind. Lond. 6: 429. 1931; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 34, 35, & 101. 1942; Moldenke, Holmbergia 4: 151. 1945; Moldenke, Bot. Gaz. 106: 162. 1945; Moldenke, Alph. List Cit. 1: 10, 28, 128, & 268 (1946), 2: 531 & 641 (1948), 3: 687, 728, 737, 805, 813, 857, 871, 872, 901, & 972 (1949), and 4: 1075 & 1078. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 70, 71, 73, & 193. 1949; R. Espinosa, Est. Bot. Sur Ecuad. 2: 68. 1949; Moldenke, Phytologia 3: 286 & 375. 1950; Moldenke, Sp. Subsp. Cont. Mold. Set 45 [3]. 1951; Moldenke, Inform. Mold. Set 46 Spec. 4. 1951;

Moldenke, Phytologia 4: 267. 1953; Moldenke, Inform. Mold. Set 48 Spec. [4] (1954) and 49 Spec. 3. 1954; Moldenke, Mem. N. Y. Bot. Gard. 9: 177. 1955; Moldenke, Inform. Mold. Set 51 Spec. 4. 1956; Moldenke, Résumé 69, 80, 81, 85, 364, & 471. 1959; Moldenke, Résumé Suppl. 3: 13 & 38 (1962), 4: 16 (1962), and 6: 5 & 6. 1963.

Illustrations: Hérincq & Gerard in Réveil, Règne Vég. 4: pl.

18 (in color). 1870.

Decumbent or prostrate perennial herb, 0.5-1 m. tall, much branched, practically glabrous, usually of straggling prostrate habit, with many stems from a thick root; stems mostly procumbent, branched; branches tetragonal, usually with ascending or erect tips, to 60 cm. or even 1 m. tall; leaves decussate-opposite, mostly brunnescent or nigrescent in drying, lanceolate-oblong, 5-6.5 cm. long, 1.8--2 cm. wide, cuneate at the base, sharply incised-serrate, reticulate-venose, glabrous on both surfaces or with a few, fine, white, appressed hairs beneath and a few coarse hairs above; spikes terminal, ternate, cylindric-filiform, the lateral ones long-pedunculate and about 4 cm. long, the central ones sessile and almost 8 cm. long; bractlets lanceolate, slightly shorter than the calyx, hispidulous; calyx green, with red stripes, hispidulous; corolla varying from blue, pale-blue, or pale bluish-violet to purplish, purple, pale-violet, pale-lilac, lilac, pale-rose, or very pale-mauve, sometimes white or almost white, the tube often red, slightly surpassing the calyx, the limb often blue-violet, 5-parted; fruit red-brown, glabrous, 4parted, included by the mature calyx.

This species was based on two collections made by Friedrich Heinrich Alexander von Humboldt and Aimé Jacques Alexandre Bonpland near Almaguer, Cauca, and near Pasto, Nariño, in the Andes Mountains of Colombia. Walpers (1845) places the species in his Section Verbenaca, Subsection Inermes, Group Foliosae, Subgroup Micranthae, and Secondary Subgroup Holophyllae, along with 22 other species. Hooker & Jackson (1895), however, reduce it to synonymy under V. literalis H.B.K., while Schauer (1847) reduces it to V. littoralis a pycnostachya Schau., with the comment "Hujus modif. monticola, magis compacta et glabrior est V. glabrata Kth." and cites Herb. Willdenow 11133. Truly, the species is closely related to V. literalis, but I have personally collected both in the field and find that the habit and aspect are quite

distinct.

Herbarium material has been misidentified and distributed under the names V. gracilescens (Cham.) Herter, V. litoralis H.B.K., V. littoralis L., and V. polystachya H.B.K.

collectors have found V. glabrata growing as a weed in gardens and upon walls, in the crevices of mud-walls, along roadsides, in humid forests, in hedgerows and roadside thickets, at the edge of cultivated and waste ground, in sandy soil on the open side of quebradas, on paramos and the floor of craters, and in raod-cuts, at altitudes of 200 to 3835 meters, flowering from November to May and July to September, and fruiting in February,

April, May, and July to September. Firmin reports it to be medicinal; Killip & Smith say that it is used in the treatment of fevers in Colombia. A vernacular name is "verbena".

It should be noted that the V. glabrata of Philippi belongs in

the synonymy of V. chilensis Moldenke, which see.

The illustration cited above, unfortunately, is only of a single pistil and therefore is of little help in identifying accurately the plant called V. glomerata. Ball makes the curious statement that the flowers of V. glabrata open "at the tips of lengthening stem". Actually, as throughout this group, it is the rachis which lengthens and the flowers always open from the bottom upwards. In all, 97 herbarium specimens have been examined by me.

Citations: COLOMBIA: Cauca: E. L. Core 207 (W--2059688); H. Pittier 1428 (W--531624). Nariño: R. Espinosa 2745 (N); Schultes & Mardoqueo 7422 (W--1996144), 7442 (W--1996163); Sneidern A.311 (S, S). Norte de Santander: Killip & Smith 21197 (W--1356107). Putumayo: Schultes & Cabrera 18901 (Ss, W-2172312). ECUADOR: Azuay: Rose, Pachano, & Rose 22851 (N, W--1022448), 22939 (N, W--1022514). Bolivar: Penland & Summers 602 (N). Caffar: Rose & Rose 22730 (N, W--1022359), 22740 (W--1022367). Chimborazo: André K.721 (N); Mille 39 (N, W--1121423); Rimbach 671 (N). Cotopaxi: Weydahl 74 (S). Imbabura: Asplund 20189 (S). Pichincha: Anthony & Tate 333 (W--1192410); Asplund 6110 (S, W-2223752), 16130 (S), 16139 (S), 17227 (S), 20151 (S); Balls 5801 (N, W--1779226); W. H. Camp E. 1746 (N); Couthouy s.n. [Quitensian Andes] (T); R. Espinosa 2435 (N); Firmin 77 (N, W--1340469); F. R. Fosberg 22543 (N, W--2109606); F. C. Lehmann 131a (Bm); Moldenke & Moldenke 19783 (B, Bs, Cb, F, Fy, Hk, Hw, Le, Lm, Mg, Mm, Mr, N, N, N, No, Ok, Ot, Rs, S, Sm, Ss, Ss), 19784 (B, Bs, F, Fy, Hk, Hw, Le, Lm, Mg, Mr, N, N, No, Ok, Ot, Rs, S, Sm, Ss, Ss, Z); G. W. Prescott 133 (N). Tunguragua: Asplund 19923 (S); Heinrichs 65 (N); G. H. H. Tate 562 (W--1197554). Province undetermined: Mille 16203 (Kr). GALAPAGOS ISLANDS: Albemarle: A. Stewart 3317 (Bi, Gg-31375, N, W--921597). Chatham: Schimpff 132 (N). PERU: Arequipa: Alva A. 0189 (W--2270251). Ayacucho: R. D. Metcalf 30294 (W--1834981). Cuzco: Herrera 3362 (N). Lima: R. Ferreyra 4087a (N). San Martin: Ll. Williams 5911 (W---1496643).

VERBENA GLANDULIFERA Moldenke, Phytologia 3: 44. 1948.

Synonymy: Glandularia glandulifera (Moldenke) Ragonese, Revist.

Invest. Agric. 5: 83 & 206. 1951. Glandularia glandularia Ragonese, Revist. Invest. Agric. 6: 82, sphalm. 1951.

Bibliography: Moldenke, Phytologia 3: 44 (1948) and 3: 76 & 1951.

135. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 106 & 198. 1949; Moldenke, Phytologia 3: 305. 1950; Ragonese,

Revist. Invest. Agric. 5: 40, 85, 207, & 208 (1951) and 6: 82, 83, & 206. 1951; E. J. Salisb., Ind. Kew. Suppl. 11: 263. 1953; Molderks.

denke, Résumé 127, 296, & 471. 1959.

Procumbent or prostrate annual herb, or to 50 cm. tall; stems and branches rather slender, obtusely tetragonal, spreading-pubescent or hirtellous with hair of various lengths, the shorter hairs glanduliferous; nodes annulate; principal internodes 1--1.5 cm. long or more abbreviated; leaves numerous, decussate-opposite; petioles 3--8 mm. long, margined; leaf-blades chartaceous, rather uniformly gray-green on both surfaces, ovate, 1--1.5 cm. long, 7-12 mm. wide, 3-lobed or 3-parted, each lobe again lobed or bluntly incised, revolute-margined, acuminate-attenuate at the apex, acuminate-attenuate into the petiole at the base, strigose above, irregularly spreading-pubescent beneath, the shorter hairs glanduliferous; midrib very slender, deeply impressed above, very prominent beneath; secondaries and tertiaries very slender, deeply impressed above, very prominent beneath; inflorescence terminal, subcapitate at first, later elongating to about 4 cm.; peduncles 1--2.5 cm. long, spreading-pubescent or hirtellous with hair of various lengths, the shorter hairs gland-tipped; bractlets lanceolate, about 5 mm. long, attenuate at the apex, puberulent on the back, long-ciliate along the margins; calyx tubular, about 6 mm. long, irregularly pubescent with gland-tipped hairs, 5costate, the rim 5-apiculate; corolla small, varying from blue to lilac or violet, its tube 8--9 mm. long, very minutely puberulous on the outside or subglabrate, its limb about 5 mm. wide.

The type of this species was collected by Nélida S. Troncoso (no. 292) at Ascochinga, at an altitude of 700 meters, Córdoba, Argentina, on October 26, 1936, and is deposited in the Britton

Herbarium at the New York Botanical Garden.

The species has been found on high rocky plateaus and on a hill near a limestone quarry, at altitudes of 700 to 2100 meters, flowering from October to April, fruiting in March and April. Burkart describes it as "common" and Troncoso as "very abundant" in Córdoba. It has been misidentified and distributed in herbaria under the names V. erinoides Lam., V. marrubioides Cham., V. microphylla H.B.K., and "cf. V. marrubioides Cham." Ragonese describes the flowers as "muy vistosas" and says "Especie originaria de las Provincias de Córdoba y Catamarca, que únicamente hemos observado en una sola oportunidad en el terraplén de las vías del ferrocarril." He distinguishes it from the related V. dissecta Willd. as follows:

1. Calyx with glandular hairs; corolla 10--14 mm. long....... V. glandulifera.

In all, 32 herbarium specimens, including the types of all the names involved, and 4 mounted photographs have been examined by me.

Citations: ARGENTINA: Catamarca: Brizuela 469 (N); Cabrera

1099 (Ja--30392, N); Castellanos s.n. [Herb. Mus. Argent. Cienc. Nat. 33877] (N); Jurgensen 1026 (W-704752); Ragonese & Piccinini 6032 [Herb. Inst. Bot. Minist. Agr. Nac. 69123] (N). Córdoba: H. H. Bartlett 20079 (Mi), 20174 (Mi); Burkart 7494 [Herb. Osten 23367] (Ug), 10413 (N); Castellanos s.n. [Herb. Osten 15289] (Ug), s.n. [Herb. Osten 15291] (Ug); T. H. Goodspeed 17246 (Ca--656782); Hieronymus s.n. [4.XI.1876] (W--281545); A. T. Hunziker 7175 (N); Lossen 72 (Ba, Mg-31); O'Donell 4427 (N), 4467 (N); O'Donell & Rodriguez 340 (Ut-115416b), 493 (Ut--115407b), 610 (Ut--115417b); Osten 10613 (Ug), 17091 (Ug); Pierotti 5108 (N); F. A. Roig 1044 [Herb. Ruiz Leal 17833] (Z); Sota 4309 (N); Troncoso 292 (F-photo of type, N--type, N--photo of type, Si--photo of type, Z-photo of type). San Luis: Digilio & Grassi 2028 (N); Terribile 739 (N). Santiago del Estero: Pierotti "h" [Tazana, 3/IV/44; Herb. Inst. Miguel Lillo 99460] (Bm, S), s.n. [Villa Gussayan, April 9, 1944; Herb. Inst. Miguel Lillo 99587] (S).

VERBENA GLUTINOSA Kuntze, Rev. Gen. Pl. 3 (2): 256. 1898.
Synonymy: Glandularia glutinosa Schnack & Covas, Darwiniana
7: 72, 74, & 75, pl. 2E, nom. nud. 1945. Verbena fischeri Mol-

denke, Alph. List Cit. 2: 625, hyponym. 1948. Bibliography: Kuntze, Rev. Gen. Pl. 3 (2): 256. 1898; Briq., Ann. Conserv. & Jard. Bot. Genev. 4: 21. 1900; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 191. 1904; Sanzin, Anal. Soc. Cient. Argent. 88: 97, 98, 124--126, & 134. 1919; Stapf, Ind. Lond. 6: 429. 1931; Moldenke, Lilloa 6: 328 (1941) and 8: 430. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 44 & 101. 1942; Moldenke, Lilloa 10: 384. 1944; Schnack & Covas, Darwiniana 7: 72, 74, & 75, pl. 2E. 1945; Schnack & Covas, Revist. Argent. Agron. 12: 223. 1945; Schnack & Covas, Darwiniana 7: 75. 1945; Covas & Schnack, Darwiniana 7: 86. 1945; Moldenke, Alph. List Cit. 1: 96 (1946), 2: 443 & 629 (1948), 3: 687 (1949), and 4: 1255. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 98, 106, & 198. 1949; Moldenke, Phytologia 3: 134 & 135 (1949) and 3: 290. 1950; Moldenke, Résumé 115, 127, & 471. 1959; Moldenke, Résumé Suppl. 3: 32 & 37. 1962.

Illustrations: Sanzin, Anal. Soc. Cient. Argent. 88: 125.

1919; Schnack & Covas, Darwiniana 7: pl. 2E. 1945.

Perennial very glabrous or glutinous herb, to 35 cm. tall, often retaining blown grains of sand; stems many, terete, to 50 cm. long, few-branched, glabrous or scarcely pilose, glutinous or subglutinous throughout; branches often decumbent, forming mats; principal internodes to 2 cm. long; leaves decussate—opposite, sessile, scarcely decurrent, linear-elongate or linear-lanceolate, to 3 cm. long and 2 mm. wide, entire or sometimes with 1 or 2 scattered very narrow teeth or lobes, the lobes 0.5-1 cm. long and basal or sub-basal, the margins scarcely involute; inflorescence spicate, the spikes at first densely, finally loosely few-flowered, terminal; peduncles 1—3 cm. long; bract-

lets small, herbaceous, about 2 mm. long, ovate, acute at the apex, ciliate along the margins; flowers about 5 per spike, slightly fragrant; calyx long-tubular, about 10 mm. long and 1 mm. wide, its rim with 2 or 3 linear-subulate teeth, shorter than the tube; corolla showy, varying from creamy-white or yellowish-green to yellow, pale-yellow, or sulphur-yellow to rose, the tube almost straight, to 15 mm. long, about 1 mm. wide at the apex, the limb to 6 mm. wide, the lobes narrow. deeply emarginate at the apex.

The type of this species was collected by Carl Ernst Otto Kuntze [no. (?) "2"] in the Cordillera at Paso Cruz, 34° S. lat., Mendoza, Argentina, at an altitude of 1500 meters, in January, 1892, and is deposited in the Britton Herbarium at the New York Botanical Garden. This specimen is also the type of V. fischeri.

Ruiz Leal describes the species as being very common all through the Mendoza region in Cretaceous sand and basaltic detritus and abundant in sandy places on undulating pampas. Wilczek describes it as "frequent". It has been collected in green meadows and sandy deposits, in arroyos, and on campos, at altitudes of 200 to 1950 meters, flowering from October to February, in fruit in January. Ruiz Leal reports that it forms mats on undulating pampas in Mendoza, preferring sandy places. Herbarium material has been misidentified and distributed under the names V. sulphurea D. Don and Glandularia laciniata Schnack. The relation of the length of style to the size of the pollen-grains is discussed by Covas & Schnack (1945). Schnack & Covas (1945) discuss the possibility of a hybrid between V. glutinosa and V. peruviana (L.) Britton.

Briquet (1900) says: "Cette belle espèce est remarquable par ses feuilles linéaires allongées, pourvues ça et là d'un ou deux segments très étroits, sa glabréité, ses glandes visqueuses retenant les grains de sable de la pampa, ses longs calices tubuleux à dents linéaires-subulées et ses élègantes corolles d'un jaune soufré à lobes profondément échancrés au sommet....Il est singulier qu'un type aussi saillant, comme les précédents d'ailleurs ait pu échapper jusqu'à maintenant aux recherches des botanistes argentins." He cites Wilczek 54 from Pampa de San Rafael in the Delessert Herbarium. Peredo describes the corolla of his plant as "purple", surely an error, although it is possible that the yellow corollas may fade out to a rose hue; in fact, Ruiz Leal 9655 bears a notation to the effect that the corolla is "yellow verging to red" or "cream to rose". Kuntze says: "Gehort in die Verwandschaft von V. sulfurea, ist aber durch die linearen Blätter, von denen unter 100 etwa 2--3 nur einen Blattzehn zeigen, die unbehaarte glutinose Beschaffenheit etc. recht verschieden....V. lavandulifolia Phil. hat ahnliche Blatter, aber kopfige, behaarte Inflorescenz, kurz Corolle, lange Bracteen. V. decurrens hat viereckigen Stengel, herablaufende Blatter mit umgebogenen Rand und sonstige Unterschiede."

In all, 31 herbarium specimens, including the types of all the names involved, and 1 mounted photograph have been examined by me.

Citations: BOLIVIA: Santa Cruz: Peredo s.n. [El Concho, 4-I-1947] (N). ARGENTINA: Mendoza: H. H. Bartlett 19521 (Au-195097, Ca--772483, Mi, Mi, W--1904542, W--1904543); Castellanos s.n. [Herb. Mus. Argent. Cienc. Nat. 36864] (N), s.n. [Herb. Mus. Argent. Cienc. Nat. 36865] (N); Kuntze 2 [Macbride photos 17418] (Kr--photo of isotype, N--type); F. A. Roig s.n. [Ruiz Leal 11935] (Z); Ruiz Leal 1952 (N), 6936 (N), 7093a (N), 7468 (N), 7500 (N), 7665 (N), 7665/14 [Goodspeed 31014] (Ca--178039, W--2322928), 7671 (N), 7671/20 [Goodspeed 31020] (Bm), 7694 (N), 9455 (N), 9655 (N), 10384 (N); Sanzin s.n. [Ruiz Leal 1414] (N); Wilczek 54 (W--1473108), 514 (W--1473109). Neuquen: F. A. Roig s.n. [Ruiz Leal 18050] (Sm). Río Negro: Calcagnini 39 [Herb. Osten 19358; Herb. Lab. Bot. Buenos Aires 13531] (Ug).

XVERBENA GONZALEZI Moldenke, Phytologia 8: 274. 1962.

Synonymy: Glandularia santiaguensis x pecakii Schnack & Gon-

zalez, Rev. Argent. Agron. 12: 290, in textu. 1945.

Bibliography: Schnack & Gonzalez, Rev. Argent. Agron. 12: 290. 1945; Moldenke, Phytologia 8: 274. 1962; Moldenke, Résumé Suppl.

4: 10, 11, & 18. 1962.

This name has been proposed for the hybrid between V. santiaguensis (Covas & Schnack) Moldenke and V. perakii (Covas & Schnack) Moldenke, thus far known only from artificial production. The hybrid may, however, be expected in the wild, since the two parental species both grow in the provinces of La Rioja and Mendoza, Argentina.

VERBENA GOODDINGII Briq., Ann. Conserv. & Jard. Bot. Genèv. 10: 103--104. 1907.

Symonymy: Verbena verna var. fissa A. Nels., Am. Journ. Bot. 18: 437. 1931. Verbena goodingii Briq. ex Moldenke, Suppl. List Invalid Names 8, in syn. 1941. Verbena bipinnatifida var. gooddingii (Briq.) Jepson, Fl. Calif. 3 (2): 382--383. 1943. Verbena gooddringii Briq. ex Moldenke, Alph. List Invalid Names Suppl. 1: 24, in syn. 1947. Glandularia gooddingii (Briq.) Solbrig, Madroña 15: 50. 1959. Verbena gooddingii x wrightii Kearney ex Moldenke, Résumé 364, in syn. 1959. Verbena bipinnatifida var. gooddingii Jepson ex Moldenke, Résumé Suppl. 2: 10, in syn. 1960. Verbena gooddingii Brand. ex Moldenke, Résumé Suppl. 3: 38, in syn. 1962. Verbena goodingii (Briq.) Munz ex Moldenke, Résumé Suppl. 3: 38, in syn. 1962. Verbena gooddingii var. gooddingii Briq. ex Moldenke, Résumé Suppl. 3: 38, in syn. 1962. Verbena goodengii Briq. ex Moldenke, Résumé Suppl. 6: 10, in syn. 1963. Bibliography: Briq., Ann. Conserv. & Jard. Bot. Genev. 10: 103--104. 1907; Prain, Ind. Kew. Suppl. 4: 245. 1913; A. Nels.,

Am. Journ. Bot. 18: 437. 1931; Perry, Ann. Mo. Bot. Gard. 20:

243, 248, 312, 335--337, & 355. 1933; Laudermilk & Munz, Carnegie Inst. Wash. Publ. 487: 279. 1938; Fedde, Bot. Jahresber. 59 (2): 417. 1939; Moldenke, Prelim. Alph. List Invalid Names 49. 1940; Moldenke, Suppl. List Invalid Names 8. 1941; Moldenke in Lundell, Fl. Texas 3 (1): 19 & 45. 1942; Moldenke, Alph. List Invalid Names 47 & 51. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 10, 11, 13--15, 18, & 101. 1942; Jepson, Fl. Calif. 3 (2): 382-383. 1943; Moldenke, Alph. List Cit. 1: 6, 23, 25, 31, 34, 57, 110, 119, 154, 200, 208, 209, 235, 242--244, 255, & 269. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 22 & 24. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 43 & 61. 1948; Moldenke, Castanea 13: 121. 1948; Moldenke, Alph. List Cit. 2: 438, 439, 452, 465, 467, 472, 474--478, 480, 482--484, 493--495, 497, 498, 503--505, 521-528, 579, 584, 587, 596, 597, 604, & 629 (1948), 3: 666, 671, 701, 702, 707, 717, 721, 723, 741, 755, 756, 769, 770, 779, 788, 794, 803, 804, 826, 828, 834, 842, 851, 871, 883, 933, & 952 (1949), and 4: 989, 996--998, 1002-1004, 1083, 1104, 1125, 1127, 1136, 1138, 1139, 1155, 1169, 1174, 1178, 1180, 1198, 1199, 1207, 1210, 1214, 1217, 1222, 1225, 1227-1231, 1237, 1239, 1240, 1242-1246, 1252, 1253, 1288, 1290, 1292, & 1298. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 13. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 11, 19, 20, 23, 25--27, 33, 164, & 198. 1949; Moldenke, Am. Wild Fls. 292 & 450. 1949; Moldenke, Phytologia 3: 132 & 133. 1949; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2209 & 2211. 1951; Clokey, Univ. Calif. Publ. Bot. 24: 193--199 & 274. 1951; Moldenke, Phytologia 4: 119. 1952; Moldenke, Inform. Mold. Set 48 Spec. [4]. 1954; Moldenke, Journ. Calif. Hort. Soc. 15: 82. 1954; Mattoon, Pl. Buyers Guide, ed. 6, 287. 1958; Moldenke, Résumé 14, 24, 26, 29, 31, 33, 39, 223, 358, 364, 378, 379, & 471. 1959; Solbrig, Madroffa 15: 50. 1959; Moldenke, Résumé Syppl. 2: 10 (1960), 3: 6, 8, 10, 32, & 38 (1962), 5: 3 (1962), and 6: 10. 1963.

Perennial (sometimes annual?) herb, decidedly gray-green throughout, forming rounded clumps or mats 15--60 cm. in diameter, often prostrate; stems usually several from a common woody base or thick rootstock, decumbent-ascending or erect, 15--60 cm. tall, stout, subobtusely tetragonal, usually much branched, densely spreading-pilose or somewhat white-villous, often glandular; branches ascending; principal intermodes 3--6 cm. long; leaves decussate-opposite, 3-5 cm. long, about 3 cm. wide, gray-green on both surfaces, deeply 3-lobed or 3-cleft and softly canescentpilose to more or less villous-hirsute on both surfaces, tapering at the base into a short margined petiole, the divisions broadly oblong, about 3 cm. long, coarsely toothed or incised to deeply incised-crenate, the margins slightly (if at all) revolute; midrib and secondary venation prominent or prominulous beneath; inflorescence terminal, pedunculate, fascicle-like during anthesis; peduncles 4--8 cm. long, stout, softly cinereous-pilose or villous-hirsute with white hairs; bractlets lanceolate, about 7 mm. long, a little shorter than the calvx. acuminate at the apex, coarsely spreading-pilose or villous-hirsute throughout, longciliate on the margins; flowers corymbose during anthesis, the

corymbs to 2.5 cm. wide, the spikes somewhat or greatly elongating after anthesis and then about 5 cm. long and 1.8 cm. wide; calyx oblong-cylindric, 8.5--11 mm. long, spreading-pilose or villous-hirsute with white hairs throughout, more or less glandular, its tube about 7 mm. long and rather prominently costate, the teeth unequal or subequal, slender, lanceolate-subulate, about 2 mm. long; corolla hypocrateriform, showy, varying from red, pink, blue-red, lavender, light-lavender, pale-lavender, bluishlavender, or lavender-blue to rich blue-lavender, purple, blueviolet, light blue-violet, violet, light-blue, or blue, sometimes whitish or white, usually pink, pale-lavender, or lavender when fresh and fading to blue, the tube not at all or slightly surpassing the calyx, pubescent on the outside, puberulent in the throat, the limb spreading, 8--12 mm. wide, subequally 5-lobed, the lobes obovate-subtruncate, about 3 mm. long and wide, retuse or slightly emarginate at the apex; stamens barely equaling the corolla-mouth; anther-glands small; pistil barely equaling the corolla-mouth; fruiting-calyx about 10 mm. long; cocci oblongelongate, brown or black, 3--4 mm. long, subcylindric, reticulate-scrobiculate or alveolate on both sides except at the merely striate base, retrorsely hispidulous on the commissure in a White linear-oblong conspicuous band.

The type of this handsome species was collected by Leslie Newton Goodding (no. 645) -- in whose honor it is named -- at Kernan, in the Meadow Valley Wash, Nevada, in 1902, and is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva. Meadow Valley Wash extends into both Lincoln and Clark Counties, but the type locality is assumed to be in Clark County. The species is widespread in Arizona, and extends also into adjacent New Mexico, Texas, California, Utah, Nevada, and Oklahoma, as well as Mexico. It was introduced into cultivation in 1929. Briquet (1907) says of it: "Cette espèce est rapportée dans l'exsiccata cité au V. bipinnatifida Nutt. qui en diffère abondamment par ses feuilles bipinnatipartites à segments étroits, l'indument rare, les bractées beaucoup plus longuement setacées, les dents calicinales longuement subulées, le tube de la corolle exsert, etc. Elle est en réalité plus Voisine du V. arizonica, dont elle s'écarte au premier abord par ses feuilles profondement tripartites." Heller reports that the fresh flowers are usually whitish, pink-tinged, turning darker or bluish in drying. Kearney notes for Fulton 6266, cited below, that "gland small on one stamen, rather large on the other, but not as high as the anther-cells."

The type of V. verna var. fissa, which is said to differ from V. verna in having pinnately cleft leaves, is Munz, Johnston, & Harwood 4252, eposited in the Rocky Mountain Herbarium.

The so-called hybrid, V. gooddingii x wrightii Kearney, was based on Ethel Palmer s.n. from San Carlos, Gila County, Arizona, concerning which Kearney says "Corolla tube too long for V. gooddingii." He also says of Eastwood 16979 "leaves exceptionally

dissected but corolla tube not longer than calyx; possibly a hybrid with V. wrightii" and of Eastwood 17772 "corolla tube 1 1/2 times calyx!; possibly a hybrid with V. wrightii". Of Clover 6383 he says "leaves more dissected and pubescence stiffer than usually". Concerning Nodwell 7086 he notes "gland rather small, much lower than the anther-cells". Loomis 835 was first determined as "V. ambrosiaefolia Rydb.", then as V. wrightii A. Gray, but Peebles and Kearney comment about it "calyx minutely glandular, pubescent with the usual tack-shaped hairs; gland very large, considerably surpassing the anther cells." Kearney & Peebles 10993a and Peebles 11332 were first identified as V. ciliata Benth., then as V. wrightii; so was Peebles 9186, whose bractlets are actually long and narrow and which may possibly represent a hybrid with V. bipinnatifida.

Verbena gooddingii has been found by collectors on hills, hillsides, and rocky hillsides, foothills and mountain slopes, flats, open or brushy flats, and dry canyon floors, in grasslands and pinyon forests, riverbeds, in clay or sandy soil, granitic soil, along roadsides, among rocks, on dry rocky slopes and gravelly hillsides, on roadside embankments and grassy slopes, in dry sandy washes, dry or sandy bottoms, and creek bottoms, on the sides of ravines, in deserts and desert grasslands, on burned-over gravelly slopes and rocky limestone slopes, sandy areas, mountainsides, desert washes, sandy flats, on canyon floors and stony adobe slopes, in the Artemisia tridentata and Juniperus association on rocky slopes, in the Pinus monophylla and Juniperus association, in juniper and ponderosa pine forests, in the juniper and yellow pine belts of vegetation, on hillsides under oaks, in sandy arroyos, and among the browse-type vegetation, at altitudes of 665 to 5670 meters. It has been collected in anthesis from February to November, and in fruit from March to October.

In Texas it is found in sandy soil and washes and on mountains. Heller states that the species is "occasional in gravelly places in juniper and oak belt of the Upper Sonoran Life Zone", Ferris found it "associated with two species of scrub oak, Cercocarpus, and Rhus trilobata", while the Hansons report it as "frequent in washes". Benson says that it occurs in the "limestone soil of Chihuahuan desert vegetation type", in the "Sonoran desert vegetation type", "in sand and gravel in the Lower Sonoran zone", and in the "Oak Woodland vegetation type"; Benson & Darrow report it from the "Southern Desert vegetation type", while Wolf, Johnson, & Everett found it at the "lower edge of Upper Sonoran life-zone with Yucca baccata in open sun in gravelly wash". Grater found it in the pinyon belt on a plateau at the head of a canyon; Clover found it on Kaibab limestone and in camyons; Darrow says that it is "frequent in gravelly canyon bottoms"; Brass reports it "frequent in damp soil of floodplains"; and Tidestrom says that it is "occasional on slopes".

In Arizona it was found by Demaree in "small fair habitats on dry red ridges". Cutler found it "frequent in pastures" in New Mexico. Wold discovered it in the Lower Sonoran zone "with Joshua trees, Salvia carnea pilosa, in sun, in dry sandy gravel in wash", "in the Upper Sonoran life-zone with pinyons and junipers, common in sun of rocky wash", "scattered in Upper Sonoran life-zone with Pinus monophylla, Yucca baccata, and Juniperus utahensis with western exposure to sun in dry gravel of open flats", "with Yucca baccata and Juniperus", and "in the Upper Sonoran life-zone on sunny hillside in deciduous red-brown volcanic rock." Ferris found it forming groundcover with Helenium hoopesii, Delphinium, Artemisia, and Pteris in pine forests. J. Goodwin 63 appears to have had white flowers and may represent a white-flowered form worthy of nomenclatural designation. Edw. Palmer 339 is also said to have had white flowers.

Common names for the species are "southwestern verbena", "southwestern vervain", and "vervain". Material has been misidentified and distributed in herbaria under the names V. ambrosiae-folia Rydb., V. ambrosiifolia Rydb., V. aubletia Jacq., V. aubletia Willd., V. aubletiana Willd., V. bipinnatifida Nutt., V. bipinnatifida var. latilobata Perry, V. canadensis (L.) Britton, V. ciliata Benth., V. ciliata var. longidentata Perry, V. ciliata var. pubera (Greene) Perry, V. gooddingii var. nepetifolia Tidestr., V. longiflora Lam., V. remota Benth., V. stricta Benth., V.

Wrightii A. Gray, and Verbenia wrightii Gray.

On the other hand, H. S. Gentry 1312, distributed as V. good-dingii, is actually V. delticola Small; Herb. Chiricahua Veg.—Study Team 1958-118 is V. ambrosifolia f. eglandulosa Perry; Mc Clatchie 175 & 176 are V. ciliata var. longidentata Perry; Good-ding 26-47, G. W. Gullion 477, M. E. Jones s.n. [Clark Mts., Sept. 14, 1932], W. W. Jones s.n. [near Bisbee, Sept. 13, 1922], Loomis & Thackery 910, and Wiggins 9146 are var. nepetifolia Tidestr., and Solbrig 2803, distributed as Glandularia goodding-

ii, is V. bipinnatifida Nutt.

As further evidence of how this species has been misunderstood by herbarium workers in the past — Eastwood 17119 was first identified as "V. ambrosiaefolia Rydb.", then as V. wrightii by Kearney; H. H. Rusby 337 was determined by the collector as V. bipinnatifida and by Farwell as V. wrightii; Kearney & Peebles 10993 & 11118 were first determined as V. ciliata, then as V. wrightii; while S. W. Hutchinson s.n. [May 1929] was annotated by various workers as V. canadensis, V. remota, V. aubletia, V. longiflora, V. bipinnatifida, and Glandularia sp. Edw. Palmer s. n. [southern Arizona, 1869] was first identified as V. aubletia, then as V. ciliata, while Kearney says of it "seems rather nearer wrightii". Of H. H. Rusby 337 Kearney says "I make this wrightii",

of T. E. Wilcox 26 and Zuck s.n. [Tucson, May 16, 1896] he says definitely "V. wrightii", while of Eastwood 18032 and T. E. Wilcox s.n. [near Williams, April 11, 1905] he says "V. wrightii?". Of Tidestrom 772 Miss Perry says "not typical", while Kearney says "V. wrightii?"; of Griffiths 4435 Kearney says "V. wrightii?", while Perry says "cfr. V. gooddingii". Of Lemmon & Lemmon s.n. [Peach Springs, June 1884] she says "toward var. nepetifolia". Of Kearney & Peebles 9720 Kearney says "Intermediate between Wrightii and Gooddingii".

On the label of C. T. Mohr s.n. [Gila River, Feb. Mar. 1873] the collector says: "This species has been recently introduced into gardens under the name of V. montana. It is very variable in foliage and habit." He is here referring, however, not to the plant comprising his specimen, but to the name which he assigned to it, V. aubletia. Both the name V. aubletia and V. montana Hortare synonyms of V. canadensis (L.) Britton, a species which is, indeed, "very variable in foliage and habit." Kearney & Peebles

11118 is identified by Kearney as V. wrightii.

Ferris & Bacigalupi 8135 is a mixture with Tragia ramosa Torr., while Nelson & Nelson 1429 in the herbarium of Catholic University was mounted with Fox J.7, which is V. ciliata. The Collector undesignated s.n. [Partridge Creek, April 26] is a mixture with V.

ciliata var. pubera (Greene) Perry.

It should be pointed out that the Newlon 653 from the Santa Rita Mountains, cited below, could be from either Pima or Santa Cruz Counties, Arizona; Dudley 10, from the Hualapi Indian Reservation, cited below from Coconino County, could as well be from Mohave County; and Eastwood 17119, from the Mazatzal Mountains, cited below from Maricopa County, could be from Gila or Yavapai County. Miranda & Deaver 5785 has a label reading "Mohave or Yavapai County". The Blumer 1345 collection, cited below, was cited by Perry as V. bipinnatifida.

Mattoon (1958) notes that the seeds of V. gooddingii are

offered to the horticultural trade by Clyde Robin.

Perry (1933) cites the following 20 additional specimens not as yet seen by me: NEVADA: Clark Co.: Goodding 645 (E--isotype, F--isotype, G--isotype). ARIZONA: Cochise Co.: Carlson s.n.

[Sulphur Springs Valley, June 3, 1915] (W); W. F. Parish 196 (G), 197 (G). Gila Co.: Goodman & Hitchcock 1297 (E). Maricopa Co.: Bartram 255 (D). Mohave Co.: M. E. Jones s.n. [Hackberry, 5-24-1884] (F). Pima Co.: Hanson & Hanson A.1021 (E, F). Yavapai Co.: Coues & Palmer 498 (E); W. W. Jones s.n. [Jerome Divide, 25 July 1921] (E). CALIFORNIA: San Bernardino Co.: Edw. Palmer 339 (E, F), s.n. [Rock Spring, May 1876] (G). San Diego Co.: Edw. Palmer s.n. [southern part of San Diego Co., 1875] (G). MEXICO: Baja

California: Orcutt s.n. [7-25-1883] (F). She says "In habit V. Gooddingii is much like V. ciliata, but differs in the villous-hirsute pubescence and the larger flowers. It is readily recognized in its typical form by the long-ciliate character of the bracts, the short dense villous spikes, and the shaggy pubescence." The Mearns collection from Fort Verde, 1881, and the Mac Dougall 603, which she cites from the Britton Herbarium, are regarded as var. nepetifolia by me, and the Edw. Palmer 339 which she cites from the same herbarium, is also regarded by me as var. nepetifolia, although specimens under this collection number in other herbaria may not represent the same taxon. Palmer's numbers, assigned largely by Asa Gray, are notoriously full of mixtures.

In all, 446 herbarium specimens, including type material of

most of the names involved, have been examined by me.

Citations: ALABAMA: Bibb Co.: C. T. Mohr s.n. (Mi). UTAH: Washington Co.: M. S. Baker 8437 (N); Eastwood & Howell 1242 (Gg-206895, N); F. W. Gould 1386 (Ca--882644, N), 1730 (Ca--882643, Gg, N, Pl--156720); Maguire & Richards 15921 (Ua--21325); B. Mc Allister s.n. [May 15, 1938] (Ua--47417). County undetermined: J. E. Johnson s.n. [s. Utah, 1876] (W--56196); Purpus s.n. [Cave Spring, May--Oct. 1898] (Ca--104881). NEVADA: Clark Co.: Clokey 7282 (Ca--900551), 7283 (B1--42304, Ca--900553, Ca--909945), Du--269985, N, Se--47446, St--19114, Ua--31276), 7284 (Ba, Ca--909943, Du-269954, N, P1--124972, Se--47605, St--19129, Ua-31283), 7686 (Ba, Ca--598472, Ca--900554, Du--258943, Gg--257095, Hp, I, La, N, Ok, Rs--20239, Se--47852, Se--52083, Ua--25349, W--1729918); Goodding 645 (Ca--50874--isotype, Du--91127--isotype, N--isotype, Po--63875--isotype, W--485355--isotype); G. W. Gullion 26f (Ca-195471); Jaeger s.n. [William Ranch] (Po--159913); Purpus 6061 (Ca-104816, Po-63967, W-348177); Train 1458 (Ca-900555, Du-287457, I, N, Tu--35539), 2009 (N). Lincoln Co.: M. E. Jones s. n. [Calientes, April 29, 1904] (Po--71255). Nye Co.: La Rivers & Hancock 401 (Ca--900552), COLORADO: County undetermined: C. C. Parry 551, in part (W-1323045). OKLAHOMA: County undetermined: G. W. Stevens 346 (Ok). TEXAS: Brewster Co.: J. F. Brenckle 51083 (Le); Nelson & Nelson 5025 (Ca--710304, W-1974036). Uvalde Co.: M. E. Jones 28301 (Po--188427). NEW MEXICO: Catron Co.: D. R. Goddard 825 (Ca--505486). De Baca Co.: A. Nelson 11307 (S). Grant Co.: Ballou s.n. [Mar. 4, 1928] (Du--193773); Maguire, Richards, & Moeller 11503 (N); C. T. Mohr s.n. [Gila River, Feb. Mar. 1873] (W--771874). Otero Co.: Cutler 2002 (Ca--882847). County undetermined: H. H. Rusby 337 (Mi). ARIZONA: Apache Co.: F. M. Chamberlain 56 (W--562805). Cochise Co.: L. D. Benson 10301 (Po-267648, Tu-35541), 11110 (Po-267657); Blumer 1345, in part (Du--9535, Se--92553); Borell s.n. [Bonita Canyon, Sept. 8, 1935] (Ca--771364); J. I. Carlson s.n. [May 20, 1915] (Gg--

31279), s.n. [Sulphur Springs Valley, June 3, 1915] (Gg-31280), s.n. [south of Warren, June 3, 1915] (W--873380), s.n. [south of Warren, June 7, 1915] (W--873381); O. M. Clark 8120 (St); Deaver 4579 (Gg); R. S. Ferris 9933 (Ca--882569, Du--278064); Foster & Arnold 206 (W--1826646); Goodding 38-50 (Gg-365609, St), 1972 (St), 2231 (Ca--130090); Goodman & Hitchcock 1211 (Du--192000); Gould & Pultz 3154 (Tu--21550), 3169b (Ca--705200, N, Tu--21586); W. W. Jones s.n. [Dragoon, Aug. 18, 1920] (Ca--407934); Kearney & Peebles 15117 (Gg-418631); Lemmon s.n. [Huachuca Mts., Aug. 1882] (Bm); W. F. Parish 190 (Du--90889); W. W. Price s.n. [Apr. 21, 1894] (Du--97120); H. A. Thornber 2981 (Tu--35544); Wiegand, Maguire, Richards, & Moeller 11150 (N), 11162 (N, Ua--47412); C. B. Wolf 2490 (Ba, Rs--9998). Coconino Co.: Benitez s.n. [Sedona, 5-7-50] (Fg--3460); Clover 6383 (Gg--325858, Mi, Tu--18626); Darrow 3112 (Tu--22019); Deaver 7 (Fg--735-374-111), 47 (Fg--734-374-111), 91 (Fg--797-374-111), 290 (Fg--871-460-111), 1527 (Fg), 2483 (Fg--2837), 3135 (Fg--3903), 3232 (Fg--3979); Demaree 40269 (Ca), 40973 (Gg), 40991 (Gg), 42557 (Gg), 44310 (S); Dudley 10 (Gg--191651); D. R. Goddard 525 (Ca--505526); A. A. Heller 15794 (Ca-726072, N, Se--87492); Jaeger s.n. [Flagstaff, Sept. 1/23] (Po--63851); Kleiner s.n. [Midgley Bridge, 4/12/50] (Fg--3459); Nelson & Nelson 2082 (Ca--580304, N, N, S, Ua--23757); H. H. Rusby 337 (W--771879); Towney s.n. [Grapevine Caffon, July 30, 1891] (W--56195); Whiting 1047 [cat. 4926] (To); T. E. Wilcox S. n. [near Williams, April 11, 1905] (W--562357). Gila Co.: Collom 21 (I), s.n. [Collom Camp] (Mi, N); Crosswhite & Sands 788 (Hi--194697); Demaree 43717 (S); Eastwood 16635 (Gg--161994), 16979 (Gg--167367); Foster & Arnold 264 (W--1826662); Goodman & Hitchcock 1297 [Herb. Drushel 8501] (Ca--426359, Du--191998, Gg-183906, Mi, Mn--17980, N, Ur); J. Goodwin 63 (Fg--2253, Gg-335923); F. W. Gould 4707 (Ca--773726); MacFadden 1054 (En-3169); Nelson & Nelson 1832 (Ca--580305, I. N. S. Ua--23758); Ethel Palmer s.n. [San Carlos, April 1932] (Gg--195225); Shreve 7451 (Rs--14794). Graham Co.: Toumey s.n. [Galiuro Mts., July 29, 1894] (W--619182), s.n. [Galiuro Mts., July 29, 1895] (Ca--25131); C. R. Van Cleve 43 (Au). Greenlee Co.: Gould & Haskell 4023 (Ca--737167, N). Maricopa Co.: Benson 10018 (Po-267647, Tu--7642); Eastwood 17119 (Gg--167368); F. R. Fosberg S.1439 (Up); J. W. Gillespie 5365 (Ba, Ca--499472, Du--217487, N. Po--218527, W--1620207); Kearney & Peebles 10993 (To), 10993a (To); Lawrence & Surber s.n. [3-27-60] (Hi--194944); Peebles 6732 (N); Peebles & Loomis 6732 (Gg--192659, Tu--35526). Mohave Co.: S. B. Benson 65 (Ca-526616); Braem 793 (Fg-9267), s.n. [Apr. 10, 1927] (Du-190298), s.n. [Apr. 1927] (Du--190297); Demaree 44480 (S); East-

wood 18032 (Gg--188960, To, W--1569542), 18353 (Gg--190310); Evenari s.n. [Peach Spring, 5.4.47] (Jr); F. W. Gould 1709 (Ca--882642, N, Tu-13788); Grater 17 (Ca--602833, Tu--31273), 240 (Ca--711778, Du--331843); A. A. Heller 16004 (Ca--725548, N, S, Se--86350); Herb. Range Surveys 119 (Tu--35543); M. E. Jones 50890 (Po--83729), s.n. [Hackberry, 5-24-1884] (Bm, Br, Du--151799, Ob--50862, Po--71258, Ua--11395, W--223793), s.n. [Chloride, April 15, 1903] (Po--71254); Kearney & Peebles 11100 (To, W--1634179), 11118 (To, W--1634189), 12669 (W--1651236); Lemmon & Lemmon s.n. [Peach Springs, June 1884] (Bm, Ca--192064, W--56204); Maguire, Maguire, & Maguire 4995 (Ca--553765, Ua--17041); Mc Clintock 52-370 (Gg--373553); Nelson & Nelson 2776 (Ca--613975, Ur); K. Rechinger 2178 (V); W. H. Rhoades s.n. [south of Kingman, April 1936] (Hs); L. S. Rose 40079, in part (Al); N. C. Wilson 99 (Du-24176, W--669737); Wooton s.n. [Kingman, Aug. 13, 1911] (W--661012), s.n. [Kingman, Mch. 11, 1912] (W-663952). Navajo Co.: Nodwell 7086 (To). Pima Co.: R. S. Beal s.n. [Bear Canyon, 12 April 1948] (Ca--942533); L. D. Benson 11096 (Po--267646); Brass 14174 (N, P1--105637), 14200 (N); F. R. Fosberg 7910 [905] (La, Po--184952); Goodding 414-45 (Tu--33601); E. H. Graham 3638 (Cm, Du--246057); E. W. Graham 7-9-6 (Cm); Griffiths 4435 (W--496229); Hanson & Hanson A. 1021 (B1-42305, Up--80475); C. B. Maguire s. n. [March 24, 1935] (N, Pl--130551, Ua--47434); Mrs. G. Mairs s. n. [Ajo, April 1916] (Tu); Markland 149 (Au); Mearns 2677 (Gg--31462); Nelson & Nelson 1364, in part (Ca--580303, P1--82322, S), 1429 (N, N, Ua--23759), 1543 (Ca--882577); K. F. Parker 5913 (Gg-341901, N); Peebles 11332 (To, W-1634289); Spalding s.n. [March 20, 1906] (Tu-32399); Thackery 90 (I, W--1469239); Thackery & Leding 1100 (W--1326921); J. J. Thornber 5169 (Ca--882861); Tidestrom 12496 (I); Zuck s.n. [Tucson, May 16, 1896] (N, W-349024, W-664468). Pinal Co.: E. H. Graham 3343 (Cm); Loomis 835 (To); Peebles 6852 (Gg--184986, Gg--192657), 9186 (To, W--1624255); J. J. Thornber s.n. [Oracle, May 12, 1905] (Ok, Ur), s.n. [Oracle, May 28, 1905] (Tu); Toumey s.n. [Galiuro Mts., July 29, 1894] (Ca--171597); Wiegand, Maguire, Richards, & Moeller 10345 (N, N, P1--130556, Ua--47413). Santa Cruz Co.: L. D. Benson 10965 (Po--267649); Eastwood 17772 (Gg--175071); Epling & Stewart s.n. [Patagonia, Sept. 4, 1936] (Ca--882570); F. R. Fosberg 7912 [917] (La, N, Up); Goodding 76-52 (Ca--39354); G. Lindsay 1164 (Du-259233); S. W. Hutchinson s.n. [May 1929] (En-960); Nelson & Nelson 1476 (Ca-882639, P1-82321, Se-16876, Ur); Newlon 653 (Ca); Tidestrom 744 (I), 772 (W--506969). Yavapai Co.: Barkley & Plondeau 4285 (Mn--35082); Cantelow s.n. [May 1, 1942] (Gg-317971); Comstock C.723 (Ak--12634); Crooks & Darrow s.n. [Con-

gress Junction, April 19, 1938] (Tu--35542); Deaver 2805 (Fg--4548); O. Degener 4532 (Ms, N); Demaree 40238 (Ca), 42221 (S), 42494 (Gg), 43883 (S); Eastwood 16699 (Gg--161993); R. S. Ferris 9899 (Ca--882645, Du--282743, Mi, Rs--26905, Se--79002); Fulton 6266 (To); H. S. Gentry 4534 (Ak--25786); J. W. Gillespie 8503 (Ca-175757, Du-219648), 8512 (Du-221442); C. F. Harbison 41178 (Ca--991068); M. E. Jones s.n. [Skull Valley, April 28, 1903] (Po--71252), s.n. [Hillside, May 1, 1903] (Po--71253); W. W. Jones s.n. [Jerome, April 14, 1920] (Ca--407932, W--1568462), s.n. [Skull Valley, June 29, '21] (Ca--407938), s.n. [Jerome Divide, July 25, 1921] (Ca--407931); Kearney & Peebles 9720 (Ca--540263, To, W--1624393); E. B. Kurtz s.n. [Yarnell, July 18, 1937] (Up); Kusche s.n. [Senator, Aug. 1, 1917] (Gg--31275); Loomis 3234 (La); Mrs. C. W. McKelvey s.n. [June 4, 1929] (Gg--170335); Miranda & Deaver 5785 (Ca); A. Nelson 10228 (Ca--500826, Mg--32, S); C. L. Porter 2816 (P1--117765); Shreve 4852 (Fs); Spangle & Goodwin 100 (Fg--3123); Tidestrom 898 (S, W--506690); Toumey 305 (Tu), 305a (W--212336), s.n. [Camp Verde, Aug. 7, 1891] (Tu); Whiting 1053 [cat. 4880] (To); Yarnell 52 (Fg--8110). Yuma Co.: Bailey & Bailey 10059 (Ba); Benson & Darrow 18068 (Po-267645); Newlon 574 (Ca); Edw. Palmer 340 (Pa); J. M. Tucker 2874 (Z). County undetermined: Edw. Palmer 339, in part [Valley of the Colorado] (Ca--187474, W--56213), s.n. [southern Arizona, 1869] (W--56214); T. E. Wilcox 26 (W-213176); N. C. Wilson s.n. [Northern Arizona, 1893] (Ca--158840). CALIFORNIA: San Bernardino Co.: A. M. Alexander 426 (Ca--625571), 1332 (Ca--666269); M. Beal 251 (Mv), s.n. [Cedar Canon, May 11, 1932] (Ca); K. Brandegee s.n. [Barnwell, May 15, 1911] (Ca--162007), s.n. [Cima, June 1915] (Ca--204980); T. S. Brandegee s.n. [Providence Mts., May 26, 1902] (Ca--124663); J. G. Cooper s.n. [summit of Providence Mts., May 29, 1861] (W--322402); R. S. Ferris 7455 (Du-194816); Ferris & Bacigalupi 8135, in part (Ca--496317, Du--213029, Ob--68410, Po-203435, Rs--8397); Jaeger s.n. [Clark Mtn., 6-22-1930] (Po--179284), s.n. [n. end of Clark Mtn., Oct. 31, 1931] (Po--180135), s.n. [3-20-1932] (Mn--20492), s.n. [Vanderbilt, March 1932] (Po-187839); Jepson 5491 (Ca), 6147 (Ca), 18244 (Ca); E. R. Johnson 962 (Ca--484190, Du--216384, Rs--1571), s.n. [May 12, 1928] (Gg-165913); Munz 12860 (Ca-495246, Mn--20538, Ob--50790, Po--184011, S); Munz, Johnston, & Harwood 4254 (Ba, Du--123238, It, Po-9671, Se--15964); Edw. Palmer 339, in part (Pa); S. B. Parish 10320 (Du-91126); Peirson 8737 (Gg-178435), s.n. [April 16, 1930] (En-1905); C. B. Wolf 3292 (Du-283164, Rs--5045, Se-58342, W-1845814), 7021 (Ca--718172, N, Rs--16253), 9680 (Gg-381244, N, Rs--23527), 10718 (Ak--14945, Ca--774739, Ok, Rs--

24589); Wolf, Johnson, & Everett 8281 [prop. no. 2637] (Ok, Rs-17925). MEXICO: Baja California: Orcutt s.n. [7-25-1883] (Cm). Sonora: Abrams 13193 (Du-213519), 13396 (Du-213611); T. S. Brandegee s.n. [Las Durasnillas, May 18, 1892] (Ca-171660); F. R. Fosberg 7911 [915] (Du-217931, Po-183231, Po-184936); H. S. Gentry 3559 (Ge); C. T. Mohr s.n. [Plains of Sonora, 20-29-80] (W-771874). CULTIVATED: California: Balls 8712 (S), 10218 (Bm); Munz & Everett s.n. [Balls 10218] (S); Walther s.n. [Santa Monica, July 10, 1929] (Gg-165710), s.n. [Santa Monica, June 1930] (Gg-178752). LOCALITY OF COLLECTION UNDETERMINED: Collector undesignated s.n. [Partridge Creek, April 26] (W-71929); Edw. Palmer s.n. [southern Utah, northern Arizona, etc., 1877] (Io).

VERBENA GOODDINGII var. NEPETIFOLIA Tidestr., Proc. Biol. Soc. Wash. 38: 15 [as "gooddingii nepetifolia"]. 1925.

Synonymy: Verbena arizonica Briq., Ann. Conserv. & Jard. Bot. Genèv. 10: 102-103. 1907 [not V. arizonica A. Gray, 1883]. Verbena verna A. Nels., Am. Journ. Bot. 18: 436-437. 1931. Verbena bipinnatifida var. nepetifolia (Tidestr.) Jepson, Fl. Calif. 3 (2): 383. 1943. Verbena ciliata var. nepetifolia Tidestr. ex Moldenke, Alph. List Invalid Names Suppl. 1: 23, in syn. 1947. Verbena goodingii var. nepetifolia Tidestr. ex Moldenke, Résumé 364, in syn. 1959. Verbena gooddingii nepitifolia Tidestr. ex Moldenke, Résumé Suppl. 3: 38, in syn. 1962. Verbena goodingii subsp. nepetifolia Rides. ex Moldenke, Résumé Suppl. 3: 38, in syn. 1962. Verbena goodingii nepetaefolia Tidestr. ex Moldenke, Résumé Suppl. 3: 38, in syn. 1962. Verbena goodingii nepetaefolia Tidestr. ex Moldenke, Résumé Suppl. 3: 38, in syn. 1962. Verbena gooddingii nepetaefolia Tidestr. ex Moldenke, Résumé Suppl. 3: 38, in syn. 1963.

Bibliography: Briq., Ann. Conserv. & Jard. Bot. Genev. 10: 102--104. 1907; Prain, Ind. Kew. Suppl. 4: 245. 1913; Tidestr., Proc. Biol. Soc. Wash. 38: 15. 1925; A. Nels., Am. Journ. Bot. 18: 436. 1931; Perry, Ann. Mo. Bot. Gard. 20: 249, 311, 323, 337-338, 340, & 355. 1933; Hill, Ind. Kew. Suppl. 9: 295. 1938; Fedde, Bot. Jahresber. 59 (2): 417. 1939; Moldenke, Prelim. Alph. List Invalid Names 44 & 49. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 10, 11, 18, & 101. 1942; Moldenke, Alph. List Invalid Names 45 & 51. 1942; Jepson, Fl. Calif. 3 (2): 383. 1943; Moldenke, Known Geogr. Distrib. Verbenac. Suppl. 1: 2. 1943; Moldenke, Bot. Gaz. 106: 161. 1945; Moldenke. Phytologia 2: 75 & 115. 1945; Moldenke, Alph. List Cit. 1: 116, 121, 178, 193, 200, 208, 234, 244, 255, & 256. 1946; Moldenke, Phytologia 2: 383. 1947; Moldenke, Alph. List Invalid Names Suppl. 1: 23. 1947; Moldenke, Alph. List Cit. 2: 399, 438, 457, 471, 472, 477-479, 483, 488, 489, 494, 497, 498, 513, 518, 522-524, 527, 550, 595, 597, 598, 606, & 618 (1948), 3: 666, 698, 701, 720, 723, 724, 755, 779, 792, 794, 803, 831, 843, 933—935, 953, & 976 (1949), and 4: 983, 984, 989, 1004, 1086, 1121, 1125—1127, 1155, 1181, 1191, 1198, 1203, 1225, 1227, 1239—1245, 1247, 1252, 1290, 1294, 1298, & 1299. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 13. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 19, 20, 26, 27, 33, & 198. 1949; Moldenke, Am. Wild Fls. 292 & 450. 1949; Moldenke, Inform. Mold. Set 48 Spec. [4]. 1954; B. H. Johnson, Wasmann Journ. Biol. 16: 295. 1958; Moldenke, Résumé 24, 25, 32, 33, 39, 358, 362, 364, 378, 418, & 471. 1959; Lewis & Oliv., Am. Journ. Bot. 48: 639. 1961; Moldenke, Résumé Suppl. 3: 8 & 38 (1962) and 6: 10. 1963.

This variety differs from the typical form of the species in having the leaf-blades broadly ovate, coarsely and unevenly dentate, at times lobed, and abruptly narrowed into a cuneate base, and the pubescence varying from strongly pilose to densely vil-

lous.

This is a perennial, fragrant, bushy herb, to 0.5 m. tall, often forming clumps to 1 m. in diameter, spreading-erect from the base; stems stout, subobtusely angular, branched, softly spreading-pubescent, the long hairs intermixed with small shortstipitate glands; branches ascending; principal intermodes elongate, about 8 cm. long; leaves decussate-opposite; petioles 1--1.5 cm. long, alate; leaf-blades broadly ovate, gray-green on both surfaces, about 3 cm. long and 1.5 cm. wide, obtuse at the apex, somewhat deeply crenate-lobed, obliquely narrowed at the base into the petiole, softly pubescent on both surfaces, the lobes 2--? mm. long, the veinlet reticulation slender, prominulous beneath; inflorescence pedunculate; peduncles to 5 cm. long, softly spreading-pilose; bractlets lanceolate, shorter than the calyx, softly spreading-pilose with coarse hairs; flowers fragrant, corymbose during anthesis, the corymbs to 2.5 cm. wide, the spikes greatly elongating after anthesis and then to 6 cm. long and 1.5 cm. wide; calyx oblong-cylindric, about 5 mm. long, gray-green, spreading-pilose throughout, the tube eventually angulate, the teeth subequal, short, 1--2 mm. long, lanceolate from a broader base; corolla hypocrateriform, showy, varying from rose, pink, pale-pink, or pinkish-blue to pale-violet, pale-lavender, lavender, lavender-pinkish, or lavender-blue, usually pink or rose when fresh and fading to magenta or blue, or deep-pink fading to lavender, drying white, its tube not at all or only slightly exserted from the calyx, greenish-white at the summit, puberulent in the throat, the limb subequally 5-lobed, 8--9 mm. wide, the lobes obovate-truncate, 2--3 mm. long, about 2 mm. wide, subemarginate at the apex; stamens scarcely equaling the mouth of the corolla-tube; anther-glands small; pistil scarcely equaling the mouth of the corolla-tube; fruiting-calyx 7--8 mm. long; cocci oblong-elongate, black, about 3 mm. long, the commissure almost smooth; chromosome number: n = 15.

Although Tidestrom published the name of this taxon as a trinomial, where the third epithet normally is taken to represent a
subspecies, he says "var. nov." after it, indicating that he intended it to be of varietal status. The type of the variety was
collected by Ivar Tidestrom (no. 8835) in El Dorado Canyon, Lincoln County, Nevada, near the Colorado River, at an altitude of
600 meters, on May 2, 1919, and is sheet no. 1221478 in the Uni-

ted States National Herbarium at Washington. The type of <u>V. arizonica</u> was collected by Marcus Eugene Jones (no. 3901) at Yucca, Mohave County, Arizona, on May 14, 1884, and is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques in Geneva. It should be noted here that the <u>V. arizonica</u> of Gray is a synonym of <u>V. gracilis</u> Desf. The type of <u>V. verna</u> was collected by Norman C. Wilson (no. 95) and is deposited in the Rocky Mountain Herbarium.

The variety has been collected on riverbanks, dry slopes, rocky slopes, and hills, along arid roadsides, in granitic soil on foothills, among granitic rocks, in Prosopis and Simmondsia association, on hillsides, in roadside deserts, on the sides of ravines, on small stream banks in red clay hills, in cultivated fields, narrow canyons, and deserts, on volcanic hills and hillsides, on mesas and gravelly slopes, in washes, sandy washes, and road-cuts, at the edges of sandy washes, in crevices and on ledges of basaltic cliffs, and in red clay of snall stream banks, at altitudes of 400 to 2000 meters, blooming and fruiting from January to November. Hanson found it to be "infrequent on lower foothills" in Pima County, Arizona. Clover reports it as "common" in washes, while Carter, Alexander, & Kellogg encountered it with Lycium and Prosopis in gravelly shallow arroyos. The vernac-

ular name, "moradilla", is reported for it.

B. H. Johnson (1958) calls it "a small shrub, about 2 feet high", but surely this is an error in observation! Ferris 9881 bears a note stating that the flowers are "pale lavender, drying White", while Kennedy states that the flowers are "rose fading to magenta". R. C. Foster says of Harbison & Stover s.n. [Laguna Chapella, May 5, 1939] "somewhat transitional to V. delticola and may be a hybrid". Kearney notes concerning Harrison & Kearney 8592 "gland very small", while of Harrison, Kearney, & Fulton 7591, Peebles, Harrison, & Kearney 317, and Thackery & Leding 1100 & 1120 he says "gland large (or rather large) but much lower and smaller (or shorter) than the anther cells". Rose, Standley, & Russell 12745 & 12745a are mixtures with V. pumila Rydb. The Mearns 159, Edw. Palmer 339, and D. T. MacDougal 603, cited below, were annotated and cited by Perry (1933) as typical V. gooddingii Briq. Strickland 89 bears a note "corolla-tube unusually elongate" Kearney thinks that the Wooton s.n. [Hackberry, Nch. 7, 1912] is "not this variety".

The chromosome complement has been counted by C. R. Bell in material taken from Bell & Newcomb 1356, with an illustration of the condition at diakinesis on the labels. Additional common names recorded for the variety are "alfombrilla", "kamiyo", and

"mint".

Herbarium material has been misidentified and distributed under the names V. ambrosiaefolia Rydb., V. ambrosifolia Rydb., V. aubletia Jacq., V. aubletia L., V. bipinnati-

fida Nutt., V. bracteosa Michx., V. canadensis (L.) Britton, V. ciliata Benth., V. delticola Small, V. gooddingii Briq., V. goodingii Briq., V. macdougalii Heller, and V. wrightii A. Gray. On the other hand, the La Rivers & Hancock 401, distributed as var. nepetifolia, is actually the typical form of the species, while Ferris 8770 is V. delticola Small. Jepson makes the amazing statement that this is "a slight leaf form scarcely worthy of a name", while actually it is quite distinct — and is especially distinct from V. bipinnatifida, of which he made it a variety!

Briquet (1907), in speaking of his V. arizonica, says "Cette espèce est rapportée dans l'exsiccata cité au V. ciliata Benth., lequel en diffère abondamment par ses feuilles profondément tripartites, à segments étroits 2--3-multifides, ses bractées bien plus courtes que le calice, etc. Elle se rapproche par la forme de ses feuilles du V. Aubletia Jacq., mais en diffère complète-

ment par l'indument et l'organisation florale."

Perry (1933) cites the following 17 additional specimens not as yet seen by me: COIORADO: County undetermined: Parry s.n.

[southern Colorado, 1867] (W). NEVADA: Lincoln Co.: T. W. Davis s.n. [El Dorado Canyon, 1880] (E). ARIZONA: Mohave Co.: M. E. Jones 3901 (F). Pima Co.: Bartram 257 (D); Beard s.n. [Tucson, 1911] (E); Greenman & Greenman 56 (E); Griffiths 3489 (E); Pringle s.n. [April 13, 1888] (E, F, G). MEXICO: Baja California: Nelson & Goldman 7123a (E); Orcutt 1303 (E, F), 5141 (E, F). Sonora: Goldman 292 (G); Edw. Palmer 307 (G). She comments that "The variety differs from the species in its much less indented and broader leaves. The pubescence is much more variable and at times harsh, suggesting an intergradation with V. bipinnatifida. The leaf-forms recall V. canadensis, but the spike is scarcely distinguishable from V. Gooddingii."

In all, 239 herbarium specimens, including type material of some of the names involved, and 3 mounted photographs and clip-

pings have been examined by me.

Citations: UTAH: Kane Co.: Siler s.n. (Up). Washington Co.: Gierisch 403 (N, Ua-47416). NEVADA: Clark Co.: Grater 50 (Ca-710362); G. W. Gullion 477 (Ca-52122); M. E. Jones s.n. [Eldorado Canon, April 30, 1907] (Po-70885); Train 1493 (Ca-900556, Gu-21294, Tu-35540), 2009 (I). Lincoln Co.: Tidestrom 8835 (W-1221478-type). COLORADO: County undetermined: C. C. Parry 551, in part (W-1323045). ARIZONA: Cochise Co.: Herb. Chiricahua Veg.-Study Team 1958-117 (Am); Hobbs s.n. [4/25/44] (Or-52110); W. W. Jones s.n. [near Bisbee, Sept. 13, 1922] (Ca-407930, Po-194003); J. G. Lemmon s.n. [Huachuca Mts., Aug. 1382] (W-56178); W. F. Parish 197 (Du-90888). Coconino Co.: Clover 6078 (Mi); Collector undetermined s.n. [Sitgreaves Peak, March 25] (W-56215). Mohave Co.: Barneby 2726 (N); Cantelow s.n.

[April 29, 1942] (Gg-316104); E. S. Clark s.n. [near Needles, Feb. 1886] (Gg--31464); Clover 6062 (Mi); Eastwood 18406 (Gg--188961); Epling & Robison s.n. [Battleship Rock, 17-VI-1935] (La); R. S. Ferris 9881 (Ca--882641, Du--278081, Mi); Grater 75 (Ca--711770); Harrison, Kearney, & Fulton 7591 (To); M. E. Jones 3901 (Br, F--photo, Fg--9529, Gg--130525, Gg--154425, N--photo, N-photo, Ob--50789, Pa, Po--71251, Si--photo, Tu, Ua--11394, W--223819, Z--photo, Z--photo); Lickty s.n. [Scott's Well, May 1, 1938] (Sd--21179); C. B. Maguire 21400 (Gg--295128, N, N, Va-47399), 21403 (N, N, Pl-130555, Ua-47400); Munz 11691 (N), 14973 (Po--229685); F. M. Reed s.n. [April 22, 1936] (Po--218616); Thackery 348 (Du-299095, I, N, W-1469240); N. C. Wilson 95 (Ca--158839); Wooton s.n. [Hackberry, Mch. 7, 1912] (W--663953). Pima Co.: Abrams 13118 (Du-213475, Ob-50765); Bartram 257 (W-1071595); W. C. Bryan 27 (Au); O. M. Clark 11168 (Ok), 11428 (Ok); Collector undesignated s.n. [Tumamoc Hill, 3/21/32] (Tu); A. Conrad s.n. [Tucson, April 25, 1915] (Tu); N. C. Cooper C.724 (Ak--12633); J. H. Ehlers s.n. [April 1, 1939] (Ur); Ehlers & Ehlers 7230 (Mi); F. R. Fosberg 7910 (En, Up); Gilman 36 (I); Goodding 414-45 (Or--55752); Gould, Darrow, & Haskell 3007 (Tu--20526); E. H. Graham 3430 (cm, Du-246093), 3505 (cm, Du-246094); H. W. Graham 8-15-30 (Cm), 8-5-37, in part (Cm); Griffiths 2421 (N), 2583 (N), 3489 (W-495815), s.n. [near Tucson, 1900] (N); Gustafson s.n. [Tucson, Jan. 8, 1932] (I); Hanson A. 344 (Ur); J. A. Harris C.16375 (N); Harrison & Kearney 3646 (W-1367449), 8592 (To); Mrs. W. Hough s.n. [Sabina Caffon, April 4, 1896] (W-349022); Kearney & Peebles 10842 (N, To); D. D. Keck 3936 (Ca-579718); Loomis & Thackery 910 (W--1326885); L. H. Pammel s.n. [Desert Lab., Jun. 9, 1926] (Io-119278); S. B. Parish s.n. [Tucson, 1901] (Po-88303), s.n. [Tucson, 1909] (Du-89504); Peebles 6755 (N), 9299 (To); Peebles & Fulton 11445 (To); Peebles, Harrison, & Kearney 317 (To, W--1287281); Pringle s.n. [April 13, 1881] (Pa, Up--17086, Vt); J. N. Rose 11968 (W--454635); Rose, Standley, & Russell 15176 (N, W-638051), 15181 (N, W--638056); Rothrock s.n. [Tucson, 1871--5] (W--771873); Shreve 5169 (Fs), 7352 (Fs, Me, Me, Mi, Rs--14852); M. F. Spencer 92 (Ca-472934, Mg--55, Mg--56, Ob--50857, Ur), s.n. [5/1922] (Ob-50858); Stiffler s.n. [vicinity of Tucson, 1925] (It); Strickland 89 (Gg-399287); L. Swingle S.69 (Tu); Thackery & Leding 1100 (To), 1120 (To); Thackery & Loomis 910 (To); Toumey s.n. [Sabina Cafion, Apr. 4, 1896] (W-664135); G. R. Vasey s.n. [Tucson, Mar. 1881] (W-155630), s.n. [Tucson, 1881] (W-56205); Wiegand, Maguire, Richards, & Moeller 10730 (N, Ua--47415), 10758 (N, N, Ua--47414); Wiggins 6519 (Ca-528072, Du--226245, Mi, W--1684632). Yavapai Co.: Crosswhite 515 (Hi--194696); Fernow s.n. [Camp Verde to

Prescott, Aug. 1896] (W--859019); Goodding 26-47 (Ca--39331, S); Mearns 159 (N). Yuma Co.: J. F. Brenckle 51125 (Le); McDougall s. n. [2-3-41] (Tu--26858); Peebles & Loomis 6757 (Gg--192655); Toumey s.n. [Camp Verde, Aug. 7, 1891] (Ca-882640). County undetermined: Kohler s.n. (Ur-17455); D. T. MacDougal 603 (Au, N); Mrs. F. Stephens s.n. [Little Meadows, June 22, 1902] (Ca--139761); G. R. Vasey s.n. (Ka). CALIFORNIA: San Bernardino Co.: M. E. Jones s.n. [Clark Mts., E. Mohave Desert] (Ca--537247); Edw. Palmer 339, in part (C); Tallant s.n. [Lanfair, March 1914] (Ca). County undetermined: N. C. Wilson 37 [Pinte Creek] (Ca--158841). MEXICO: Baja California: Bell & Newcomb 1356 (Ld, Ld, Le, N, W-2130805); T. S. Brandegee s.n. [Feb. 12th, 1889] (Du-24175), s.n. [Agua Dulce, May 16, 1889] (Ca-104812), s.n. [Vallederos Ck., May 4, 1893] (Ca--104813); Carter, Alexander, & Kellogg 1885 (Ca--916142, W--2034361); K. L. Chambers 729 (Du--406304); R. J. Ferris 8574 (Du--229065, W--1686956); Hammerly 432 (Du--295383, Gg--294855, W--1896177); C. F. Harbison 27283 (Ak--12911), s.n. [April 30, 1940] (N); Harbison & Stover s.n. [Laguna Chapella, May 5, 1939] (Sd--25262); G. Lindsay s.n. [July 10, 1937] (Du--259287); Meling 6 (Du--225541, W-1635285), 12 (Du--225544, Po--209971, W--1635291); Nelson & Goldman 7123a (W--565210); C. R. Orcutt 670 (Ca--104884), 1303 (C, Ca--25143, Mn--11967, Pa), 5141 (N), s.n. [10-5-1882] (W--1323076), s.n. [Piñone Forest, 10-6-1882] (W-56177), a.n. [Rosario, 5.3.1886] (Ca--192069, Dt, Mi), s.n. [near Rosario, 5-4-1886] (Al); Purpus 206 (Ca--104874); Raven, Mathias, & Turner 12605 (Ca-171729); J. Whitehead 779 (Du--248591); Wiggins 4411 (Du--259477), 4411a (W-1739794), 5289 (Ca-660799, Du-265428, Gg-305089, Mi, N, Po-261851, Se-82528, W-1824003), 9146 (Du--258595, W--1747508). Nuevo León: Arsène s. n. [Monterrey, 5-1911] (N); Edwards & Eaton s.n. [Monterey, 1846] (T); Safford 1274 (W--573322). Sinaloa: J. G. Ortega 4541 (W--1084147); Rose, Standley, & Russell 13449 (N, W--535272). Sonora: R. S. Ferris 8770 (Du--229060, N); F. R. Fosberg 7911 (Up); Frye & Frye 2310 (N, Se--65803); H. S. Gentry 356 (Du--263866); Goldman 292 (N, W-335789); Goodding 952 (W-661707); P. B. Kennedy 7033 (Ca--373594, Du-217703, Gg--187785, W--1287204); MacDougal 73 (W-574274); Mearns 1904 (Du-24196, W-232443), 1914 (Du-24197, W--232672); R. Moran 4028 (Du--361696); Edw. Palmer 307 (W-56203); Rose, Standley, & Russell 12745, in part (W-635561), 12745a (N), 12840 (N, W--635660); Shreve s.n. [Apr. 8, 1932] (Cm); Studhalter 1349 (W--1685673); Wiggins 6382 (Du-253442, W-1739923), 7171 (Du-251391), 7225 (Ca--666016, Du-261497, Rf, W-1747238), 8201 (Du-264452, Mi, W-1824373), 11775 (Ca-93153, W--2264369). MOUNTED CLIPPINGS: Proc. Biol. Soc. Wash. 38: 15. 1925 (W. W).

XVERBENA GOODMANI Moldenke, Phytologia 6: 330. 1958.

Bibliography: Moldenke, Phytologia 6: 330. 1958; Moldenke, Ré-

sume 26, 365, 375, & 471. 1959.

This is a natural hybrid between V. stricta Vent. and V. halei Small, with intermediate characters. The leaves are variously incised and lobed as in V. halei, but are densely canescent-pubescent beneath and to 7 cm. long and 4.5 cm. wide. The stems and branches are densely canescent-pubescent, as are also the peduncles, rachids, and calyxes. The spikes are very numerous and very slender, to 30 cm. long, with overlapping calyxes, very sparsely fruited.

The type of this hybrid was collected by George Jones Goodman (no. 6474) -- in whose honor it is named -- along a roadside 3 miles north of Willis, Marshall County, Oklahoma, on June 28, 1957, and is deposited in the H. N. Moldenke Herbarium at Yonkers, New York. The collector notes that the hybrid is infrequent or occasional among the two parents. It has been found in sand and on grassy ground, flowering from June to August. Herbarium material has been misidentified and distributed under the names V. blanchardi Moldenke and V. simplex x stricta Gates. In all. 20 herbarium specimens, including the type, have been examined by me. Citations: OKLAHOMA: Marshall Co.: Alder s.n. [July 10, 1950] (Ok); G. J. Goodman 5418 (Ok), 5749 (Ca-81915, Ok, Ur, Ur), 6474 (Bi-isotype, Ca-isotype, Fg-isotype, S-isotype, Z-type, Z-

VERBENA GOYAZENSIS Moldenke, Bull. Torrey Bot. Club 77: 404. 1950.
Bibliography: Moldenke, Bull. Torrey Bot. Club 77: 404. 1950;
Moldenke, Revist. Sudam. Bot. 8: 168. 1950; E. J. Salisb., Ind.

Kew. Suppl. 11: 263. 1953; Moldenke, Résumé 110 & 471. 1959. Herb, about 1.5 m. tall; stems coarse, obtusely tetragonal, deeply 4-sulcate between the angles, rather densely scabrouspubescent with short whitish hairs; nodes annulate; principal internodes 1.5 -- 5 cm. long; leaves decussate-opposite, sessile; leaf-blades firmly chartaceous but fragile, grayish-green on both surfaces, elliptic, 3--5 cm. long, 1.2--2 cm. wide, acute at the apex and base, regularly serrate with rounded revolute-margined teeth, very scabrous-pubescent above (the hairs soon deciduous, leaving the lamina white-pustulate) and subbullate, appressedpubescent on the venation beneath; midrib slender, impressed above, very prominent beneath; secondaries slender, 5--7 per side, ascending, not arcuate, impressed above, very prominent beneath; Vein and veinlet reticulation very abundant, deeply impressed above and very prominent beneath; inflorescence terminal, paniculate; peduncles aggregate in groups of 4--6, slender, 2.5--34 cm. long, irregularly glandular-pubescent, its branches similar in all respects; floriferous spikes small, less than 1 cm. long, densely many-flowered, erect; bractlets lanceolate, 2.5--3 mm. long, attenuate at the apex, densely long-strigose and also more or less glandular; calyx about 1 mm. long; corolla very small, red, its tube about 1 mm. long, the limb about 1 mm. wide.

The type of this species was collected by Goro Hashimoto (no. 663) at Rio de Peixa, Municipio de Goiás, Goias, Brazil, on August 7, 1949, and is deposited in the herbarium of the Instituto Botanico at São Paulo, Brazil. In all, 3 herbarium specimens, including the type, and 3 mounted photographs have been examined by me.

Citations: BRAZIL: Goias: Hashimoto 663 (F--photo of type, N-isotype, N--photo of type, Sp--55342--type, Z--photo of type); Macedo 3858 (W--2248938).

VERBENA GRACILESCENS (Cham.) Herter, Revist. Sudam. Bot. 4: 186--

Synonymy: Verbena officinalis? var. gracilescens Cham., Linnaea 7: 254--255. 1832. Verbena officinalis β Hook. apud Cham., Linnaea 7: 255, in syn. 1832. Verbena officinalis a gracilescens Cham. ex Schau. in Mart., Fl. Bras. 9: 191. 1851. Verbena officinalis var. gracilescens Cham. ex Kuntze, Rev. Gen. Pl. 3 (2): 257. 1898. Verbena officinalis var. gracilescens (Cham.) Kuntze ex Seckt, Rev. Univ. Nac. Córdoba 17: 90. 1930. Verbena gracilescens Cham. ex Moldenke, Prelim. Alph. List Invalid Names 46, in syn. 1940; Maria, Pl. Vall. Cochamb. 38. 1962. Verbena officinalis var. gracilescens Hauman-Merck apud Gray Herb. Card Index n. d. [1941 or before]; Moldenke, Alph. List Invalid Names Suppl. 1: 26, in syn. 1947. Verbena officinalis var. "b" gracilescens (Cham.) Augusto, Fl. Rio Grande do Sul 233, in syn. 1946. Verbena angustifolia Lam. ex Moldenke, Alph. List Invalid Names Suppl. 1: 22, in syn. 1947 [not V. angustifolia L., 1941, nor Michx., 1803, nor Mill., 1768]. Verbena gracilescens f. typica Osten ex Moldenke, Alph. List Invalid Names Suppl. 1: 24, in syn. 1947. Verbena officinalis var. gracilescens Griseb. ex Moldenke, Alph. List Invalid Names Suppl. 1: 26, in syn. 1947. Verbena officinalis var. major Osten ex Moldenke, Alph. List Invalid Names Suppl. 1: 26, in syn. 1947. Verbena officinalis var. tenuis Cham. ex Moldenke, Alph. List Invalid Names Suppl. 1: 26, in syn. 1947. Verbena gracilescens (Cham. & Schlecht.) Herter ex Moldenke, Résumé 365, in syn. 1959. Verbena gracilescens f. glabra Osten ex Moldenke, Résumé 365, in syn. 1959. Verbena gracilescens f. subglabra Osten ex Moldenke, Résumé 365, in syn. 1959. Verbena gracilescens (L.) Briq. ex Moldenke, Résumé Suppl. 3: 38, in syn. 1962. Verbena officinalis var. minor Osten ex Moldenke, Résumé Suppl. 3: 40, in syn. 1962. Verbena gracilescens Cham. & Schlecht. ex Moldenke, Résumé Suppl. 6: 10. 1963.

Bibliography: Cham., Linnaea 7: 254-255. 1832; Griseb., Abh. K. Gesell. Wiss. Gutting. 24 [Symb. Fl. Argent.] 276. 1879; Lorentz & Niederlein, Exped. Rio Negro 2 (Bot.): 264. 1881; Lillo, Fl. Tucuman 94. 1888; Kuntze, Rev. Gen. Pl. 3 (2): 257. 1898;

Speg., Anal. Soc. Cient. Argent. 53: 249 [Nov. Add. Fl. Patag. 2: 72]. 1902; Chod., Bull. Herb. Boiss., sér. 2, 2: 817. 1902; Chod., Plant. Hassler. 9: 196. 1902; Hicken, Chloris Plat. Argent. 197. 1910; Hauman-Merck, Anal. Mus. Argent. Hist. Nat. Buenos Aires 24: 414. 1913; Hicken, Physis 2: 114. 1916; Seckt, Rev. Univ. Nac. Córdoba 17: 90, pl. 18, fig. 486. 1930; Herter, Revist. Sudam. Bot. 4: 186. 1937; Gallinal, Bergalli, Campal, Aragone, & Rosengurtt, Stud. Nat. Mead. Urug. 81. 1938; Herter, Revist. Sudam. Bot. 6: 97. 1939; Moldenke, Prelim. Alph. List Invalid Names 46. 1940; J. A. Clark, Gray Herb. Card Index [1941 or before]; Ragonese, Darwiniana 5: 413. 1941; Moldenke, Lilloa 6: 328-330 (1941) and 8: 430. 1942; Moldenke, Alph. List Invalid Names 47 & 49. 1942; Schnack, Anal. Inst. Fitotéc. Sta. Catalina 4: 19 & 20. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39--41, 44, & 101. 1942; Rosengurtt, Estud. Prad. Nat. Urug. 3: 236 & 237. 1943; Herter, Revist. Sudam. Bot. 7: 225. 1943; Schnack & Covas, Darwiniana 6: 470 & 473. 1944; Moldenke, Lilloa 10: 346-347 & 384. 1944; Schnack & Covas, Bol. Soc. Argent. Bot. 1: 284. 1946; Moldenke, Alph. List Cit. 1: 12, 29, 80, 86, 92, 202, 217, 219, & 296. 1946; Augusto, Fl. Rio Grande do Sul 212 & 233. 1946; Rosengurtt, Estud. Prad. Nat. Urug. 5: [Fl. J. Jackson] 394. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 22, 24, & 26. 1947; Moldenke, Phytologia 2: 338. 1947; Ragonese & Covas, Darwiniana 7: 445, 451, 455, & 487. 1947; Hill & Salisb., Ind. Kew. Suppl. 10: 242. 1947; Moldenke, Castanea 13: 119. 1948; Moldenke, Alph. List Cit. 2: 358, 364, 371, 374, 375, 378, 380, 426, 458, 532, 533, 537, 575, 586, 599, 627, & 628 (1948), 3: 662, 672, 673, 732, 733, 745, 749, 765, 767, 780, 781, 804, 859, 862, 869, 876, 907, 911, 913, 923, 931, & 966 (1949), and 4: 984, 1010, 1072, 1082, 1087, 1088, 1090, 1091, 1100, 1166, 1168, 1194, & 1293. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 94, 98--100, 106, & 198. 1949; Rosengurtt, Lilloa 20: 139. 1949; Cabrera, Lilloa 20: 175 & 328. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 13. 1949; Moldenke, Phytologia 3: 135 (1949) and 3: 377. 1950; Martinez Crovetto & Piccinini, Revist. Invest. Agric. 4: 178 & 226. 1950; Moldenke, Phytologia 4: 121. 1952; Moldenke, Inform. Mold. Set 48 Spec. [4]. 1954; Reitz, Sellowia 11: 57 & 134. 1959; Moldenke, Résumé 110, 115, 118, 119, 127, 357, 364, 365, 371, & 471. 1959; Maria, Pl. Vall. Cochabamb. 38. 1962; Moldenke, Résumé Suppl. 3: 14, 38, & 40 (1962), 4: 17 (1962), and 6: 10. 1963. Illustrations: Seckt, Rev. Univ. Nac. Cordoba 17: pl. 18, fig.

Annual, biennial, or perennial and suffrutescent, branching herb, 20 cm. to 1 m. tall; leaves decussate-opposite, the blades rarely linear; flowers small or very small, in loose spikes, the corolla varying from light-blue, pale-blue, blue, bluish, clear-blue, dark-blue, rose-blue, lilac-blue, or violet-blue to violet, clear-violet, pale-violet, bright-violet, dark-violet, violet-rose, lilac, clear-lilac, blue-lilac, or purple, occasionally

White; chromosome number: 2n = 42.

The species has been found by collectors inhabiting wet mead-

ows and fields, the shores and banks of rivers, wet places along the edges of streams, the edges of ditches and of cultivated fields, stony places, thickets, and the edges of woods. It has been collected at the edge of arroyos and of montes, among grasses on river shores, on hillsides, pampas, and dry plains, in woods, bushy woods, and alfalfa fields, in both cultivated and uncultivated land, in dry soil and in sandy loam in full sunlight, on the high parts of wet meadows, along roadsides through cultivated fields, in tall-grass pajonales, in grassy fields and in sandy soil along riverbanks, among weeds in damp soil, near shrubs on the floor of rocky canyons, in quebradas and damp places, wet places and low fields, wet ground among spiny shrubs, low and cultivated or wet campos, wet hedges, and on dry sunny campos, at altitudes of 40 to 2665 meters. It has been collected in anthesis during every month of the year, and in fruit in August, September, and December.

Meyer says that it is a "weed in cultivated places", and Fries states that it grows in "open grassy places in the region of much rainfall. Schreiter calls it a "planta playera", while Ruiz Leal found it "en alfalfares sucios". Eyerdam & Beetle say that it is "a common weed" in Jujuy, while Cabrera (1949) says of it: "uliginosa frecuente en los baffados pacidos". Ragonese & Covas (1947) say "Planta bienal o perenne, erguida, común en potreros, baldios, terraplenes, etc." and cite Rosetti, Covas, & Ragonese 4847 and Covas & Ragonese 3774. Ragonese (1941) cites his no. 2058 from Santa Fé; Augusto (1946) cites a Sellow s.n. from Uruguay and a Kadletz s.n. from Rio Grande do Sul. Rosengurtt (1943) says "Hierba hemicriptófita, florece de fines de primavera a principios de otofio. Habita prados uliginosos, interstiticios de rocas, claros de bosque; es escasa y desaparece en los campos muy trabajados."

Chamisso's original discussion (1832) of this plant is worth repeating here: "E Montevideo misit Sellowius. Ab europaea stirpe potissimum diversa: gracilitate caulium filiformiumque ramorum, tenuitateque omnium fructificationis partium subdimidio minorum, foliis ambitu saepius lanceolatis inciso-dentatis, rarius laciniatis trifidisque, dentibus laciniisque integerrimis acutis, floralibus lineari-lanceolatis integerrimis, fructu dimidio minori, intensius ferrugineo, pariter nervoso, at veryice minus rugoso seu reticulato. -- Rhizoma lignescens. Caules erecti, subsesquipedales, fastigiatim ramosissimi; ramis provectiori aetate maxime evolutis spicas primarias alares superantibus. - Forsitan diversa: noluimus infirmam hujus vilioris gregis proponere speciem. Confer. Hook. bot. misc. 2 p. 16. V. officinalis B, quae cum genuina in campestribus Americae australioris proveniens, foliis ut nostra, nec vero gracilitate et tenuitate partium differre dicitur."

Common names recorded for the species are "camaradinha",
"formosa sem dote", "jurubepa", "yerba de la golondrina", "yerba
de Santa Ana", and "yerba de Santa María". On Fries 27 a note
states that the flowers were "white or pale-blue"; white-flowered

specimens are also represented by Eyerdam & Beetle 22553 & 22577, Sota 85, Venturi 5504, and Wall & Sparre s.n. [12/11/46]. Lillo describes his no. 11996 as "forma foliis strigosis". Archer 4627 has linear leaves, perhaps because the plants were chewed off by grazing animals and the specimens represent second growth; it was collected on the banks of the Río Paraná. J. West 8281 is a mixture with V. parvula Hayek. The species is said to be mentioned by Martinez Crovetto & Piccinini in Revist. Invest. Agric. 4: 30 & 78 (1950), but this is not true, nor does this name or "Verbena officinalis 3" appear in Hook., Bot. Misc. 2: 16 (1831) as it claimed in the literature.

Herbarium material of V. gracilescens has been misidentified and distributed by various collectors and museum workers under the names V. caracasana H.B.K., V. ephedroides Cham., V. filicaulis Schau., V. intermedia Gill., V. litoralis H.B.K., V. litoralis var. caracasana Briq., V. littoralis Kunth, V. littoralis var. caracasana Briq., V. officinalis L., and V. polystachya H.B.K. On the other hand, the Jörgensen 3767, distributed as V. officinalis var. gracilescens, is actually in part V. brasilien-

sis Vell. and in part V. litoralis H.B.K.

It should be noted that the V. angustifolia of Linnaeus and of Michaux are V. simplex Lehm., while that of Miller is Stachy-tarpheta angustifolia (Mill.) Vahl. Bang 1058 was identified as V. polystachya by Rusby in his published list of collections. The Herb. Herter 95525, previously reported as V. gracilescens, is actually V. litoralis H.B.K., while A. Stewart 3317 is V. glabrata H.B.K.

Verbena officinalis var. minor is based on Osten 3333 from Dayman, dept. Salto, Uruguay, collected on October 18, 1896, and is deposited in the herbarium of the Museo Nacional de Mistoria Natural at Montevideo, and later described by Osten as "Verbena gracilescens Cham. forma foliis strigosis subforma minor, floribus obscure violaceis." His V. gracilescens f. typica is based on Osten 3936 from the shores of the Rio Y near Durazno, dept. Durazno, Uruguay, collected on November 7, 1899, and deposited in the same herbarium, described by him as "foliis subtus in nervis strigis obsitis, fl. pallide violaceis." His V. officinalis var. major is based on Osten 3334 from Dayman, dept. Salto, Uruguay, collected on October 18, 1896, deposited at Montevideo, and described by him at first as "foliis glaberrimis", but later as "V. gracilescens Cham. forma foliis subtus parce strigosis, fl. obscure violaceis." The type of V. gracilescens f. subglabra was collected by Miguel Lillo (no. 10692) in cultivated campos around the city of Tucumán, dept. Capital, Tucumán, Argentina, at an altitude of 450 meters, in October, 1910, and is deposited in the same Montevideo herbarium, while that of V. gracilescens f. glabra was collected by Teodoro Rojas at Villa Encarnacion, on the shore of Río Alto Paraná, Paraguay, and is also deposited at Montevideo.

Hauman-Merck (1913) cites his no. 347 from Río Negro, Argentina, while Martinez Crovetto & Piccinini (1950) cite their no. 4729 from Entre Ríos. Maria (1962) cites his no. 173/4a from Cochabamba. Martinez Crovetto & Piccinini describe the plant as "Hemicriptófita con flores lilacinas y ramas erguidas, frecuente en los palmares del oeste y centro de Entre Ríos; se trata de una especie muy común en casi todos los bosques en galería de la región mesopotámica. La floración se produce en verano."

In all, 256 herbarium specimens, including the types of most

of the names involved, have been examined by me.

Citations: BRAZIL: Rio Grande do Sul: Rambo 4152 (Rb), 30975 (N). Santa Catarina: Reitz 3287 [Herb. Reitz 5006] (Le, S, S, W-2027830). São Paulo: Tamandaré & Brade 6692 [Herb. Brade 6692] (N, Sp-6723). State undetermined: Sellow s.n. [Brasilia] (Br). BOLIVIA: Cochabamba: Asplund 4067 (S, Us); Buchtien 2414 (W--1159361); Cardenas 2390 (N, W--1878099); Julio II.205 (W--1542913); Mrs. R. S. Shepard 254 (Gg--31402, N. W--1197308). Tarija: Pflanz 2131 (W--1234360); J. West 8281, in part (Ca--565124). Province undetermined: M. Bang 1058 [Bolivian Plateau] (Bm, C, Pa, W--71999, W--1416741); Steinbach 1614 [Herb. Inst. Miguel Lillo 31419] (N). PARAGUAY: Fiebrig 4432 (Bm, W--1159389); Hassler 2585 (Ca--929415), 3391 (N), 7593 (Ca--944364, N); Herb. Herter 84841 (N, N); Kuntze s.n. [Concepcion, IX.92] (N); Morong 1014 (C, C); Pedersen 1200 (W--2122710), 3984 (W--2283351), 4072 (W--2283664); T. Rojas 357 (Bm, S), 1668 [Herb. Osten 8568; Hassler 1668] (N, S, Ug), 1888 [Herb. Hort. Parag. 10058; Herb. Osten 13550] (Ug), 2526 [Herb. Osten 13183] (N, Ug), 10858 (N), s. n. [Herb. Osten 7903] (Ug), s.n. [Herb. Osten 13550] (N, S), s.n. [Herb. Osten 13556] (S). URUGUAY: Arechavaleta 39, in part (Ug), 40 (Ug); Berro 39 (Ug), 4115 (N), 3424 (N); Castellanos s.n. [Herb. Inst. Niguel Lillo 11767] (N, N), s.n. [Herb. Inst. Miguel Lillo 15781] (N, N); Gallinal, Aragone, Bergalli, Campal, & Rosengurtt 1710 (N); Herter 1053 [Herb. Herter 32656] (B, Ca-348971, N, N, N, S, W-1422056), 1861a [Herb. Herter 99314] (B, Ew, N, W-1934877), 50890 (N), 83241 (N), s.n. [Herb. Osten 18490] (S, Ug), s.n. [Herb. Osten 18491] (Ug), s.n. [Herb. Osten 18499b] (Ug); Legrand 570 (Ug), 2008 (Ug), 2370 [Isla de Pichon] (Ug), 2572 (Ug), 3428 (Ug); Osorio 1008 (Ug--13217); Osten 3333 (Ug), 3334 (Ug), 3936 (Ug), 21700 (S, Ug), 21713 (Ug); Rosengurtt & Gallinal 5803 (N, Ug-14212, W--1908543); W. E. Safford 90 (W--922260); Schröder 117 [Herb. Osten 19911] (Ug); Hugh H. Smith 82 (W--1193735); Wetmore 877 (W--1066026). ARGUNTINA: Buenos Aires: Burkart 4330 [Herb. Osten 22469] (Ug), 10062 (Ca--3487); Cabrera 1605 [Herb. Osten 22286] (Ug), 5704 (N); Lanfranchi 460 (N);

Miers 734 (W-1343919); Sota 85 (N); J. Tweedie s.n. [Buenos Ayres] (Bm); Venturi 59 [Herb. Inst. Miguel Lillo 31418] (N, S). Catamarca: Venturi 7160 (Gg--161368). Chaco: R. M. Aguilar 532 (Es, N); Jorgensen 2467 [Herb. Inst. Miguel Lillo 31430; Herb. Osten 11874] (N. Ug. W--1055177); T. Meyer 514 [Herb. Osten 22698] (Ug); Rodrigo 2537 (N); T. Rojas 12038 [Herb. Inst. Miguel Lillo 107795](Ca--164357); A. G. Schulz 1487 (N), 1886 (N). Córdoba: Castellanos s.n. [Valle de los Reartes; Herb. Osten 15285] (Ug); Cozzo s.n. [Barrio Jardin, Oct. 1946] (N); Galander s.n. [Córdoba, 15.XI.1879] (N); Hieronymus s.n. [Córdoba, X.1819] (Br); Hunziker 6318 (N, Si); Lorentz 113 (Br), s.n. (Sg--68312); Troncoso 316 (N, N); J. J. Valencia s.n. [Herb. Inst. Bot. Darwinion 16064] (N, N); Villafañe 172 (N). Corrientes: Ibarrola 1901 (S, W--2049624), 2169 (S); Rodrigo 665 (N). Formosa: I. Morel 104 (N), 1129 (N); Pierotti 4076 (Bm), 4256 (N). Jujuy: Eyerdam & Beetle 22553 (Ca--655647), 22577 (Ca--655659); R. E. Fries 27 (N, S); Garolera & Romero s.n. [Laguna Tala, 10-I-1947] (N); Venturi 4893 (Ca--376027, Gg--158246, W--1591450), 5380 [Herb. Osten 20799] (Ca-376213, E-960421, Gg--158660, N, Ug, W--1440827). La Rioja: Cuezzo 1006 (N). Mendoza: Née 4 (Q); Ruiz Leal 1018 (N), 3057 (N), 8099 (N), 8434 (N), 8948 (N). Misiones: Archer 4627 (H--67940, W--1691996); Bertoni 2461 (N); D. Rodriguez 69 [Herb. Inst. Miguel Lillo 31425] (N, W--1802571); G. J. Schwarz 1294 (N, St). Rio Negro: W. Fischer 203 (Cm, N, Ur, W-704396). Salta: Burkart 13192 (N); R. E. Fries 577 (S); Lillo 10996 [Herb. Osten 8464] (Ug); D. Rodriguez 144 [Herb. Inst. Miguel Lillo 31420] (Ca-3320, N, Ug-4941, W-1858261); Schreiter 11466 (Ca, N); Sparre 1269 (S); Venturi 5471 (Gg--159311), 5504 (Bm, Gg--159153, N, N, N, S, V-2767, Vi, W-1442820, W--1591474); Wall & Sparre s.n. [Río Calderas, 5/12/46] (Ew); Willink 72 (S). San Juan: Cuezzo 1285 (N), 1321 (N), 1441 (N). San Luis: Cuezzo 2238 (N); J. D. Varela 452 (N, Ok, Rf). Santa Fé: Balegno 495 (N); Burkart 5807 (N, N), 9083 (W--1858301); Job 1048 (N); C. Meyer s.n. [T. Meyer 3001] (N); Ruiz Huidobro 3080 (Gg-353254, N), 3182 (N, Ok, Rf), 3216 (N), 3381 (N, N), 3418 (N); Terribile 403 (N), 455 (N). Santiago del Estero: Cuezzo 2382 (N); Lillo 6185 [Herb. Inst. Miguel Lillo 31423] (N); Luna Risso 8 (N), 23 (N). Tucumán: Baer 39 (S); R. E. Fries s.n. [near Tucumán, 16.10.48] (S); Lillo 10692 [Herb. Inst. Miguel Lillo 31413; Herb. Osten 8463] (Du-317607, N, Ug, Ug-4940); Lorentz & Hieronymus s.n. [5--22.XII. 72] (N); T. Meyer 3421 [Herb. Inst. Miguel Lillo 35404] (En, N); Moldenke & Moldenke 19722 (Es, Lg, N, Sm); Monetti 91 [Herb. Osten 10878] (Ug), 96 [Herb. Inst. Miguel Lillo 31421] (N); Peirano s.n. [Mariño, Oct. 15, 1932; Herb. Inst. Miguel Lillo 32897 (N);

Schreiter 73 [Herb. Inst. Miguel Lillo 32767] (N), s.n. [San Pedro de Colalao, Dec. 1917; Herb. Osten 12187] (Ug), s.n. [Tucumán, Oct. 17, 1917; Herb. Osten 12188] (Ug); C. Skottsberg s.n. [Estacion Agricola Experimental, 16/10/48] (Go); Terribile 144 (N), 287 (N); Venturi 78 (W-1591211), 462 [Herb. Inst. Miguel Lillo 31428] (N, W-1591220), 2300 (Ca-342547, S, W-1343273); Wall & Sparre s.n. [12/11/46] (Ew), s.n. [24/11/46] (Ew). Province undetermined: Jameson 125/26 (W-1544546); Tamson s.n. (V-8997). LOCALITY OF COLLECTION UNDETERMINED: Née 114 (Q).

VERBENA GRACILIS Desf., Cat. Pl. Hort. Reg. Par., ed. 3, 393.
1829 [not V. gracilis Cham., 1832].

Synonymy: Verbena remota Benth., Pl. Hartw. 21. 1839. Verbena parviflora Ruíz ex Walp., Repert. Bot. Syst. 4: 25, in syn. 1845 [not V. parviflora Larraff., 1923]. Verbena arizonica A. Gray, Proc. Am. Acad. Sci. 19: 95. 1883 [not V. arizonica Briq., 1907]. Verbena parviflora Pavon ex Moldenke, Résumé Suppl. 6: 11, in syn. 1963.

Bibliography: Desf., Cat. Pl. Hort. Reg. Par., ed. 3, 393. 1829; Benth., Pl. Hartw. 21. 1839; Walp., Repert. Bot. Syst. 4: 24--25. 1845; Schau. in A. DC., Prodr. 11: 549. 1847; S. Wats., Proc. Am. Acad. Sci. 18: 136. 1883; A. Gray, Proc. Am. Acad. Sci. 19: 95. 1883; Hook. f. & Jacks., Ind. Kew. 2: 1178 & 1179. 1895; M. Armstrong, Field Book West. Wild Fls. 435. 1915; Stapf, Ind. Lond. 6: 429. 1931; Perry, Ann. Mo. Bot. Gard. 20: 245, 248, 261, 297, 300--301, & 355. 1933; Moldenke, Prelim. Alph. List Invalid Names 44, 48, & 56. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 10, 14, 18, 74, & 101. 1942; Moldenke, Alph. List Invalid Names 45, 47, & 50. 1942; Herter, Revist. Sudam. Bot. 7: 225. 1943; Moldenke, Bot. Gaz. 106: 161. 1945; Moldenke, Alph. List Cit. 1: 28, 46, 53, 203, 216, 242, 246, 254, & 261. 1946; Moldenke, Phytologia 2: 331. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 44. 1948; Moldenke, Alph. List Cit. 2: 393, 403, 467, 480, 497, 498, 519, 527, 540, & 626 (1948), 3: 656, 685, 698, 708, 730, 740, 752, 765, 767, 785, 787, 799, 828, 830, 831, 891, 933, & 963 (1949), and 4: 996, 1076, 1128, 1171, 1174, 1175, 1180, 1224, 1229, 1233, 1245, 1247, & 1291. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 19, 26, 33, 164, & 198. 1949; Moldenke, Phytologia 3: 73. 1949; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 4: 2209 & 2211. 1951; J. Rzedowski, Anal. Esc. Nac. Cienc. Biol. 8: 105. 1954; Moldenke, Inform. Mold. Set 49 Spec. 3. 1954; Moldenke, Résumé 24, 32, 39, 223, 358, 365, 373, & 471. 1959; Moldenke, Résumé Suppl. 2: 11, 12, & 22. 1960; F. Miranda, Bol. Soc. Bot. Mex. 26: 181, 182, 184, & 219. 1961; Moldenke, Résumé Suppl. 3: 10 (1962) and 6: 11. 1963.

Illustrations: M. Armstrong, Field Book West. Wild Fls. 435.

1915

Low diffusely branched annual or perennial herb, varying from upright to decumbent or semi-prostrate; stems 20-40 cm. long or

tall, widely branching, round-angled, whitish-hirsute, more or less glandular; branches decumbent to ascending, more or less glandular, canescent, hirsute; leaves decussate-opposite, abundant along the stems, ovate or obovate, 1--8 cm. long, cuneate at the base and narrowed into a margined petiole, incised-pinnatifid to pinnately cleft or bipinnatifid, the segments oblong or lanceolate, rather acute, hirsute especially beneath, sometimes glandular, subincised, the midrib and venation impressed above; spikes terminal, sessile, slender, more or less sparsely flowered, to about 15 cm. long, the lowermost flowers often appearing in the upper leaf-axils; bractlets linear, attenuate, gradually decreasing in length toward the tip of the spike, usually much longer than the calyx; flowers small; calyx 2--3 mm. long, more or less glandular-hirtellous, the rim subtruncate, the teeth minute and subulate; corolla inconspicuous, varying from blue or light-blue to lavender-blue, lilac, pale-mauve, pink, or purple, its tube somewhat longer than the calyx, the limb 2--3 mm. wide; cocci 1.5-2 mm. long, finely scrobiculate from the apex practically to the base, the commissural face muricately scabrous.

This species was described by Desfontaines from a specimen cultivated in 1829 in the Jardin des Plantes at Paris and probably deposited in the herbarium of the Muséum National d'Histoire Naturelle in that city. The type of V. remota is Hartweg 174 from Aguas Calientes [or Zacatecas, according to the Kew specimen], Mexico. Schauer (1847) reduces both V. remota and V. gracilis to synonymy under V. canescens H.B.K. Hooker & Jackson (1895) reduce V. arizonica A. Gray to V. remota, and then reduce the latter and V. gracilis to V. canescens. In my Prelim. Alph. List Invalid Names 56 (1940), Alph. List Invalid Names 47 (1942), and Résumé 365 (1959) I also erroneously reduced V. gracilis to

symonymy under V. canescens.

It should be noted here that V. gracilis of Chamisso is a synonym of V. intermedia Gill. & Hook., the V. arizonica of Briquet is a synonym of V. gooddingii var. nepetifolia Tidestr., and the V. parviflora of Larrañaga belongs in the synonymy of V. litoralis H. P. V.

Verbena gracilis is placed by Walpers (1845) in his Sect. Verbenaca, Subsect. Inermes, Group Foliosae, Subgroup Micranthae, Secondary Subgroup Schizophyllae, along with 9 other species. The species inhabits sandy or dry red gravelly soil, sandy loam, and rich moist soil of open woodlands and fields, and has been collected in waste places and grasslands, swales and dry steepwalled canyons, on gravelly brush-covered plains, mesas and bare hills, roadside bankings and moist depressions, roadsides in high level ground, pedrigal lava-beds and grassy plains, dry calcareous mesas and volcanic flats, among pines in mountains, on flat mountaintops with acacias, and the sides of steep dry ravines, at altitudes of 1300 to 2832 meters, blooming and fruiting from March to September. Mueller says that it is rare in

meadows in Nuevo León, while Benson reports it from swales in desert grasslands in the Lower Sonoran life-zone. It was apparent-

ly introduced into cultivation in or about 1829.

Herbarium material of this species has been misidentified and distributed under the names V. bracteata Lag. & Rodr., V. bracteosa Michx., V. bracteosa var. brevibracteata Gray, V. canescens Kunth, V. hastata L., V. menthifolia Benth., V. multifida Pav., V. neomexicana Small, V. plicata Greene, and even Myosotis sp. in the Boraginaceae. On the other hand, the Waterfall & Wallis 13806 distributed as V. gracilis is partly V. canescens H.B.K. and partly V. ciliata Benth.; Conzatti 4288 is V. camescens; J. R. West 13216 is V. ciliata; Parry & Palmer 720 is V. elegans var. asperata Perry; while Goodding 334, Herb. Le Roy s.n. [Ariz., '84], M. E. Jones s.n. [Colonia Juarez], C. B. Maguire 10884, and Pringle s.n. [Santa Rita Mts., May 11, 1884] are all V. neomexicana var. xylopoda Perry. The MacDougal 634 previously regarded as V. gracilis proves actually to be V. neomexicana var. hirtella Perry. The J. J. Thornber s.n. [Rosemont, Sept. 2, 1905], cited below from Santa Cruz County, may actually have been collected in Pima County, Arizona.

Waterfall found this species on dry grassy and grassy stony flats, while with Wallis he found it on silty flats, cliff sides and top, and in grasslands with stony outcrops or with scattered pines. Gregory & Eiten encountered it "in wet alluvial sand among boulders next to river in barranca". McVaugh reports it from "periodically flooded flats and sandy washes entering the flats", while Maysilles found it on "gentle west-facing slopes of broad arroyo, open grasslands in pine-oak woodLand" and describes it as

a "roadside weed in open meadows in pine forests."

Perry (1933) cites the following 36 additional specimens not as yet seen by me: ARIZONA: Cochise Co.: Blumer 1612 (E, F, G); Lemmon s.n. [Tanner's Cañon, near Fort Huachuca, 1882] (G). Pima Co.: Pringle s.n. [Gardiner's Spring, June 25, 1882] (D, F, G). LEXICO: Aguas Calientes: Hartweg 174 (G, K). Chihuahua: Pringle 54 (G), s.n. [near Chihuahua, 7 May 1887] (E, F). Durango: Nelson 4593 (E); Edw. Palmer 135 (E, F, G), 456 (G). Federal District: Pringle 6539 (D, E, F, G), 9135 (E, G). Hidalgo: Pringle 7590 (E, F), 13159 (F, G). México: Berlandier 578 (E); Bourgeau 361 (G); Rose, Painter, & Rose 8495 (G). Oaxaca: Seler 22 (G). San Luis Potosi: Parry & Palmer 722 (E, G); Schaffner 720 (D, E, G). She says "V. gracilis is probably a relative of V. canescens and V. neomexicana. It is easily recognized by its slender habit, usually long-attenuate bracts, tiny flowers, and essentially scrobiculate nutlets. The specimen from Utah is atypical, but for practical purposes seems better referred here."

In all, 153 herbarium specimens have been examined by me. Citations: UTAH: San Juan Co.: Rydberg & Garrett 9201 (N).

ARIZONA: Cochise Co.: Blumer 24 (Tu), 1612 [N.24] (Du--9546, Ka--60316, N, Tu, W--561809, W--563384); Goodding 292 (Tu); Mearns 1116 (W--229064); Pataky s.n. [Fort Huachuca, 1890] (W--771871); W. W. Price s.n. [Aug. 24, 1893] (Du--96341); Pringle s.n. [Camp Lowell, June 8, 1882] (Du--91156); Shreve 7734 (Fs, Mi); Waterfall 12914 (St); T. E. Wilcox 29 (W--213239), s.n. [Ft. Huachuca, July 1892] (C), s.n. [Near Fort Huachuca, 1894] (W--213031). Pima Co.: Pringle s.n. [Gardiner's Spring, June 25, 1882] (C, Ll, Pa, Sg--68313, Up--17096, Vt, W); J. J. Thornber 5637 (Tu). Santa Cruz Co.: L. Benson 10426 (Po--267651, Tu--14082); J. J. Thornber s.n. [Rosemont, Sept. 2, 1905] (Tu). MEXICO: Aguas Calientes: Hartweg 174 (N). Chihuahua: Correll & Johnston 21530 (Ld); Le Sueur 872 (Au); Mexia 2568 (Ca-442625, Gg-286757, Mi); Edw. Palmer 200 (W--573677); Pringle 54 (Vt), s.n. [24 Julio 1385] (Me), s.n. [7 May 1887] (Ca--104858), s.n. [22 Mayo 1887] (Me); Shreve 8008 (Fs), 8044 (Fs, W--1749160); S. S. White 2468 (Mi). Coahuila: Stanford, Retherford, & Northcraft 126 (Ca-713894, Du-291287, N, Se--70452). Durango: J. H. Maysilles 7497 (Mi, N), 8097 (Mi); E. W. Nelson 4593 (W--332609); Edw. Palmer 135 (Ca-104859, Me, Me, N, W--304237), 456 (W-571481), 911 (W--304612); Waterfall 15402 (St), 16163 (Ca), 16178 (Ca); Waterfall & Wallis 13402 (St), 13417 (St), 13483 (St), 13528 (St), 13622 (Ok). Federal District: Balls 4952 (W-1793739), B.4952 (Ca-684616); Bourgeau 361 (Br), 547 (Br, S); G. L. Fisher 35208 (Ew, Mi, N, W--1686256), s.n. [Villa de Obregon, July 18, 1935] (Fs); E. Lyonnet 1233 (W-1746020), 1562 (W--1746717); Miranda, Barkley, & Rowell 7462 (Au); Pringle 6539 (Br, Ca--104857, Cm, Gg--152313, Io--38759, Me, Me, Me, Me, Mi, Lim--15393, N, S, Vt, W--287765), 9135 (N); Rose & Hay 5488 (W-3952118); Rose, Painter, & Rose 8495 (W-451987); A. J. Sharp 44228 (N). Guanajuato: Née 28 (Q). Guerrero: Hinton 5847 (N, W--1844912). Hidalgo: Moore & Wood 4131 (Ba); Pringle 7590 (B, Po--63968), 13159 (Gg--421272, Mi, Tu-35528, Vt, W--461756), s.n. [El Salto, 15 Sept. 1902] (Vt); F. Salazar s.n. [Huauchinango] (Me), s.n. [Nopala, Aug. 1, 1913] (W-1013229). Jalisco: Gregory & Eiten 158 (Mi); McVaugh 16880 (Mi). México: Berlandier 578 [274] (Du--166499, W--1169371); Bourgeau 361 (Cb); Matuda 26165 (Cb), 26302 (Z); J. V. Santos 2204 (Mi); Schiefer 39 (Vi). Nuevo León: M. T. Edwards 49 (Du-277046); Frye & Frye 2392 (W-1790998); C. H. Mueller 2392 (Mi). Querétaro: Kuntze 28444 (N, N); Waterfall & Wallis 13996 (St). San Luis Potosi: Barkley, Rowell, & Paxson 826 (Au--123256, N); Barkley, Webster, & Paxson 768 (Au-123279, N), 810 (Au-123255, N); C. L. Lundell 5047 (La); Parry & Palmer 722 (Io, Pa, W-56185). Sonora: Gregg s.n. [San Lorenzo, 11/47] (T); S. S.

White 947 (Mi). Vera Cruz: A. J. Sharp 45487 (N). Zacatecas:

Shreve 7199 (Ca--731765, Fs); Weintraub & Roller 20 (Mi). State undetermined: Halsted s.n. [La Olla] (T); Née 104 (Q); Schmitz 478 (Bm); W. Schumann 1070 [Faral] (W--1323054). CULTIVATED: France: M. Martens s.n. [h. b. Par. 1835] (Br, Br), s.n. [hort. insul. 1836] (Br). LOCALITY OF COLLECTION UNDETERMINED: Herb. Jan. Gen. 22 Spec. 3 (S).

VERBENA GRISEA Robinson & Greenm., Am. Journ. Sci. 150 [ser. 3, 50]: 142--143. 1895.

Bibliography: Robinson & Greenm., Am. Journ. Sci. 150 [ser. 3, 50]: 142-143. 1895; Durand & Jacks., Ind. Kew. Suppl. 1: 451. 1906; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 34 & 101. 1942; Moldenke, Castanea 13: 116. 1948; Moldenke, Alph. List Cit. 3: 972. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 71 & 198. 1949; Moldenke, Résumé 81 & 471. 1959.

Densely and somewhat sericeously grayish-tomentose, in parts brownish or ferruginous in the dried state; stems tetragonal, somewhat furrowed; internodes mostly considerably exceeding the subtending leaves; leaves decussate-opposite, petiolate; leafblades ovate or deltoid in outline, 2.5 cm. or more long, so densely pubescent as to obscure completely the venation on both surfaces, bininnatifid, the rachis and segments very narrow, not 2 mm. wide, frequently curled, obtusish at the apex; inflorescence branched, the flowers small, borne in slender loose elongating spikes, the central spike floriferous almost from the base, the others more or less pedunculate; bractlets small, subulate, 1/3 to 2/3 the length of the calyx, pubescent; calyx cylindric, about 2 mm. long, 5-ribbed, hirsute-pubescent on the outer surface, the rim very shallowly and obtusely 5-toothed; corolla nearly twice as long as the calyx, pubescent in the throat, the limb unequally 5-lobed, the lobes rounded at the apex; anthers unappendaged.

The type of this very distinctive species was collected on Duncan Island, Galapagos Islands, in August, 1891. The authors say that it is a member of the Leptostachya "with much the habit of V. remota Benth., but differing in pubescence and foliage." The species is said to be rare around 1250 feet elevation on Duncan Island. It has been collected in anthesis in August and in fruit in August and December. In all, 3 herbarium specimens and 4 mounted photographs have a large of the species was collected on August and 4

mounted photographs have been examined by me.

Citations: GALAPAGOS ISLANDS: Duncan: A. Stewart 3315 (Gg-31276, N), 3316 (F-photo, Gg-31277, N-photo, Si-photo, Z-photo),

VERBENA GYNOBASIS Wedd., Chlor. And. 2: 156. 1860.

Synonymy: Verbena bella R. A. Phil., Anal. Mus. Nac. Chil.

1891: 58. 1891.

Bibliography: Wedd., Chlor. And. 2: 156. 1860; R. A. Phil., Anal. Mus. Nac. Chil. 1891: 58. 1891; Hook. f. & Jacks., Ind. Kew.

2: 1179. 1895; Durand & Jacks., Ind. Kew. Suppl. 1: 451. 1906; Reiche, Fl. Chile 5: 285 & 286. 1910; Moldenke, Suppl. List Invalid Names 7. 1941; Herrera, Sinop. Fl. Cuzco 1: 352. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 42 & 101. 1942; Moldenke, Alph. List Invalid Names 45. 1942; Moldenke, Lilloa 8: 430 (1942) and 10: 384. 1944; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 101 & 198. 1949; Moldenke, Alph. List Cit. 3: 687 & 813. 1949; Moldenke, Phytologia 3: 454. 1951; Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 54. 1951; Moldenke, Résumé 115, 121, 358, & 471. 1959; Ricardi, Gayana 3: 13. 1961; Moldenke, Phytologia 3: 454. 1951; Moldenke, Résumé 115, 121, 358, & 471. 1959; Ricardi, Gayana 3: 13. 1961;

Moldenke, Résumé Suppl. 3: 14. 1962.

Herbaceous perennial or slightly suffruticose, canescenthirtous throughout, 10--20 cm. tall; stems several from a single root, somewhat woody at the base, decumbent and spreading over the ground, about 15 cm. long; branches ascending; branchlets short, in the leaf-axils, foliose, resulting in an appearance of pseudo-verticillate linear leaves; leaves numerous, sessile, 1--1.5 cm. long, 3-parted so deeply to the base as to give the appearance of a whorl of 6 linear simple leaves at each node, the segments linear or narrow-linear, obtuse or rather acute at the apex, entire or rarely bifurcate, revolute along the margins; spikes terminal, short-pedunculate, many-flowered, the floriferous portion short, ovate after anthesis, in fruit not over 1.5 cm. long; bractlets linear, half as long as or slightly shorter than the calyx, 2--4 mm. long; calyx linear or prismatic, 4--8 mm. long, the rim 5-fid, the teeth bristle- or awl-shaped; corolla dark-red, its tube subinfundibular, about half again or twice the length of the calyx, the limb rose-purple or deep-red, Vivid, ampliate, about 1 cm. wide, the lobes rounded, subemarginate at the apex; stamens included in the corolla-tube; anther-connectives unappendaged; one of the style-branches hornlike and smooth, the other obtuse and papillose; ovary deeply 4-lobed or -lobulate to the middle; cocci about 2.5 mm. long, Wrinkled or obsoletely scrobiculate on the dorsal surface.

The type of this species was collected by Hugh Algernon Weddell along the road from Tacna to La Paz, at 4000 feet altitude, in the Cordillera de Tacora, Peru. The type of V. bella was collected by Rudolf Amandus Philippi at Sibaya in the Cor-

dilleras de Tacna, Tarapacá, Chile.

Herrera (1941) cites a "Gay 1839" from "Cuzco: Andes del Departmento" in Peru, which is probably the type collection of var. strigosa Wedd. (see below). The species has been gathered at 2400 meters altitude in Bolivia, flowering in April. The original publication is sometimes cited as "1855", "1857", or "1857-61", but seems actually to have been issued in 1860. The calyx is described as 4-5 mm. long in V. gynobasis and 8 mm. long in V. bella. Acevedo de Vargas (1951) cites the 3 following specimens and photographs: CHILE: Tarapaca: C. Rahmer s.n. [15. III.1885] (Sg-54671), s.n. [III.1885] (Sg-42458); R. A. Philippi s.n. [Sibaya; Macbride photos 17419] (Sg-photo).

In all, 3 herbarium specimens and 2 mounted photographs have

been examined by me.

Citations: BOLIVIA: Santa Cruz: Troll 3312 (B). Province undetermined: Lobb s.n. [Bolivia; Herb. Reichenbach f. 158619] (N, V). CHILE: Tarapacá: R. A. Philippi s.n. [Sibaya; Macbride photos 17419] (Kr--photo, N--photo).

VERBENA GYNOBASIS var. STRIGOSA Wedd., Chlor. And. 2: 156 [as "B strigosa"]. 1860.

Bibliography: Wedd., Chlor. And. 2: 156. 1860; Moldenke, Résu-

mé Suppl. 3: 13 & 38. 1962.

This variety differs from the typical form of the species in having the hair on the stems, branches, and leaves more strigose,

rather than hirtous, and the corollas smaller.

The type of the variety was presumably collected by Claude Gay in the Andes of Cuzco, Peru, in 1839, if we can assume that the second specimen mentioned by Weddell in his discussion of V. gynobasis represents this variety which he designated as "6" and that the first represents the typical form of the species. It is known to me only from the original description.

VERBENA HALEI Small, Bull. Torrey Bot. Club 25: 617. 1898. Symonymy: Verbena leucanthemifolia Greene, Pittonia 5: 135. 1903. Verbena hallei Small ex Moldenke, Suppl. List Invalid Names 8, in syn. 1941. Verbena hallii Small ex Moldenke, Suppl. List Invalid Names 8, in syn. 1941. Verbena halei L. ex Moldenke, Alph. List Invalid Names Suppl. 1: 24, in syn. 1947. Verbena coerulea Vatke ex Moldenke, Résumé 362, in syn. 1959 [not V. coerulea Hort., 1959]. Verbena haleii Small ex Moldenke, Résumé 365, in syn. 1959. Verbena haleyi Small ex Moldenke, Résumé 365, in syn. 1959. Verbena helei Small ex Moldenke, Résumé Suppl. 3: 38, in syn. 1962. Verbena officinalis x xutha Engelm. ex Moldenke, Résumé Suppl. 3: 40, in syn. 1962. Verbina halei Small ex Moldenke, Résumé Suppl. 3: 42, in syn. 1962.

Bibliography: Small, Bull. Torrey Bot. Club 25: 617. 1898; Britton & Br., Illustr. Fl., ed. 1, 3: 70, fig. 3057. 1898; Greene, Pittonia 5: 135. 1903; Small, Fl. South. U. S., ed. 1, 1008 & 1009. 1903; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 191. 1904; Prain, Ind. Kew. Suppl. 3: 187. 1908; Small, Fl. Southeast. U. S., ed. 2, 1008 & 1009. 1913; Britton & Br., Illustr. Fl., ed. 2, 3: 95, fig. 3552. 1913; E. D. Schulz, 500 Wild Fls. 178--179. 1922; E. D. Schulz, Texas Wild Fls. 337-338. 1928; Small, Man. Southeast. Fl. 1137. 1933; Sperry, Sul Ross Bull. 19: 68. 1933; Perry, Ann. No. Bot. Gard. 20: 247, 259, 265-267, & 355. 1933; Dermen, Cytologia 7: 161--163, fig. 11. 1936; Cory, Texas Agr. Exp. Sta. Bull. 550: 88. 1937; Ranson, Texas Wild Fl. Legends, ed. 2, 113. 1940; Moldenke, Prelim. Alph. List Invalid Names 47. 1940; Moldenke, Suppl. List Invalid Names 8. 1941; Sperry, Sul Ross Bull. 22: 41. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1],

4-6, 10, 11, 13, 14, 18, & 101. 1942; Moldenke, Alph. List Invalid Names 47 & 48. 1942; Moldenke in Lundell, Fl. Texas 3 (1): 16 & 21--23. 1942; Schnack, Anal. Inst. Fitotéc. Sta. Catalina 4: 18. 1942; A. M. T. Davis, Study Boscaje Palma 72. 1942; Schnack & Covas, Darwiniana 6: 470. 1944; Darlington & Janaki Ammal, Chromosome Atlas 270. 1945; Murrill, Guide Fla. Pl. 48. 1945; Moldenke, Bot. Gaz. 106: 160 & 161. 1945; Moldenke, Am. Journ. Bot. 32: 609. 1945; Moldenke, Phytologia 2: 68, 84, 87, 115, & 128 (1945) and 2: 162--163. 1946; G. L. Fisher, Am. Bot. Exchange List. 1946; Tolstead & Cory, Field & Lab. 14: 60. 1946; Moldenke, Alph. List Cit. 1: 4, 13, 14, 31, 36, 38, 42, 43, 49, 91, 97, 108, 111, 115, 119, 125--127, 130, 135, 154, 159, 195--197, 199, 202, 203, 209, 216, 226, 244, 253, 267, 270, 276, 280, 281, 291, & 297. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 24. 1947; Moldenke, Phytologia 2: 327-329, 1947; H. N. & A. L. Moldenke, Pl. Life 2: 62. 1948; Moldenke, Castanea 13: 112 & 113. 1948; Moldenke, Wrightia 1: 222--224. 1948; Moldenke, Alph. List Cit. 2: 391, 394, 397, 398, 407, 416, 438, 451--453, 457, 470, 471, 474--480, 488, 495-498, 505, 507, 511-513, 516, 519-522, 527, 537, 560, 576, 582, 584, 588, 596, 598, 609, 615, 625, 630--632, & 641 (1948), 3: 656, 664, 665, 678, 680--683, 698, 717, 718, 723, 729, 740, 754, 756, 769, 783--785, 787--789, 791, 795--798, 803, 805, 806, 809, 844, 854, 855, 858, 866, 873, 874, 882, 883, 885, 886, 893, 914, 915, 918, 927, 931, 932, 936, 939, 942, 946, 948, 950, & 978 (1949), and 4: 983, 988--993, 997, 1003, 1004, 1024, 1076, 1098, 1099, 1103, 1105, 1107-1112, 1117--1119, 1121, 1122, 1128, 1129, 1138, 1139, 1147, 1149--1151, 1162, 1164, 1168, 1170, 1171, 1173, 1179, 1180, 1183, 1184, 1191, 1201, 1207, 1212-1214, 1217, 1218, 1221, 1228, 1230, 1238, 1239, 1241, 1246, 1290, 1292, 1298, & 1299. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 0, 10, 11, 18, 19, 21, 23, 25, 26, 33, & 198. 1949; Moldenke, Am. Wild Fls. 293 & 450. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 13. 1949; Moldenke, Phytologia 3: 72 & 132 (1949) and 3: 467. 1951; McDougall & Sperry, Plants Big Bend 146. 1951; Moldenke, Phytologia 4: 166. 1953; Moldenke, Inform. Mold. Set 48 Spec. [4] (1954) and 49 Spec. 3. 1954; Moldenke, Phytologia 5: 132 & 133. 1955; Moldenke, Biol. Abstr. 30: 1093. 1956; Moldenke, Inform. Mold. Set 51 Spec. 4. 1956; Moldenke, Phytologia 6: 330. 1958; Moldenke, Am. Midl. Nat. 59: 342, 344, & 361. 1958; Shinners, Spring Fl. Dallas 325. 1958; Moldenke, Résumé 11, 13-15, 22, 23, 26, 29, 31, 32, 39, 223, 362, 365, 368, & 471. 1959; Moldenke, Résumé Suppl. 1: 2 (1959) and 2: 2 & 3. 1960; Lewis & Oliver, Am. Journ. Bot. 48: 639--641. 1961; Moldenke, Résumé Suppl. 3: 2--7, 10, 38, 40, & 42 (1962), 4: 2 & 4 (1962), 5: 2 & 4 (1962), and 6: 3. 1963.

Illustrations: Dermen, Cytologia 7: 163, fig. 11. 1936; Lewis

& Oliver, Am. Journ. Bot. 48: 640. 1961.

Slender, nearly smooth, annual or perennial herb, 20-120 cm. tall, erect, not spreading (or rarely nearly prostrate), branched at the base or (usually) branched only near the top; roots fibrous; stems usually several from a woody base, erect, to 55 cm. tall, ascendingly branched, glabrous or strigillose above,

leafy below; bark green; branches erect, about 45 cm. long; leaves decussate-opposite, 3--10 cm. long, strigillose on both surfaces, diverse in outline -- the basal and lower stem-leaves oblong to ovate, tapering into a petiole approximately as long as the leafblade, variously and irregularly dentate or incised to lobed or dissected, the middle stem-leaves 1- or 2-pinnatifid, with shorter petioles, and the uppermost sparingly dentate or entire; spikes slender, open, elongate, 2--5 per branch, paniculately disposed; bractlets about half as long as the calyx, appressed, ciliate-margined; flowers small, odorless; corolla varying from blue, bluish, light-blue, pale-blue, bluish-lavender, or purpleblue to purplish, deep blue-purple, lavender-purple, purple, lavender, pale-lavender, light-lavender, gray-lavender, or pinkishlavender, its tube scarcely longer than the calyx, the limb 6--7 mm. wide, the lobes retuse at the apex; fruiting-calyxes remote, 3-3.5 mm. long, strigillose, subtruncate, the broad veins terminating in unequal subulate teeth; fruit not much longer to twice as long as broad; cocci trigonous, approximately 2.5 mm. long, usually prominently striate, raised-reticulate at the apex, the commissural faces muricate; chromosome number: n = 7, 2n = 14.

The type of this species was collected by Josiah Hale somewhere in Louisiana and is deposited in the Torrey Herbarium at the New York Botanical Garden, although the original description cites, in addition, Croft 119, Heller 1419, and Palmer 242, with no specific type designated. The species is named in honor of the

original collector.

This very common species from the southern United States and adjacent Mexico passed for many years as V. officinalis L., an Old World species introduced sparingly in the eastern and southeastern United States, but not known from Texas where V. halei is extremely abundant and widespread. The Texan record for V. officinalis given by Britton & Brown (1903 & 1913) refers to V. halei. The type of V. leucanthemifolia was collected by Samuel Mills Tracy (no. 7996) at Abilene, Taylor County, Texas.

Verbena halei has been collected in clay, red sandy clay, sandy, light sandy, tight sandy, dry sandy, and yellow clay soils, sandy-gravelly, heavy alkaline, limestone, and rocky limestone soils, on rough stony hillsides and calcareous prairies, in sandy oak and post oak woods and rich meadows, dry and open ground, dry rocky or gravelly open ground, waste ground and sandy or sandy clay loam, on prairies and sandy prairies, dry banks and low sand ridges, sandy bottoms, heavy alkaline soil of mesquite forests, mud flats, grassy road shoulders, along road-sides and sandy roadsides. near gravel pits, in dry exposed soil along railroad tracks, in open ground and fields, sandy or moist bottomland pastures, sandy fallow fields, sandy woodlands, pine-hardwood forests, ditches and roadside ditches, dry pasture lands, gravelly sandbars, house-ruins, mesquite forests, clay hardpan, sandy meadows, and open waste ground, on sand or red sand,

sandy hillsides, granite outcrops, dry prairies, levees, and dry ridges, at the borders of sandy woods, at the edge of grassy slopes in mixed pine-oak woodland associations, between sugarcane fields, at the edge of city streets, in open cedar woods on granite and in woods on sand, along little valleys in rocky calcareous soil on hillsides, in sandy clay, open grasslands, black or black bottom soil, red sandy soil, deep sand, and low places in prairies, moist swales in sandy prairies, on gravelly and on rocky open ground, in wet soggy places, in brush along small arroyos, grassy openings in post oak woods, on mesquire prairies and sandy uplands, in the shade of trees in old riverbeds, in openings in oak-hickory woods, along fencerows, on sandstone bluffs and sandy ridges, on ungrazed cleared sandhill areas in oak forests, oak-pine woods on gentle slopes, in the rocky beds of small streams and dry charco beds, in dry valley land and open prairies, on rocky riverbanks, and in sand and shell soil, at altitudes of 3 to 135 meters, flowering in every month of the year. It has been collected in fruit from March to January.

Collectors record the species from swales and moist swales, among brush on hard-packed caliche sand flats, in sandy soil at the edge of live oak motte near the coast, in deep white sand on flat slopes, vacant lots, open roadsides, waste places in fields, as a weed in disturbed soil of grass nurseries, loose sand, pasture areas at the edge of beaches, clearings near ponds, along ditches in deserts, blackland prairies on Upper Cretaceous marls on top of Marquez salt domes, close to water's edge at lakes, clay dunes, sandy prairie flats between live oak mottes, roadside clearings in brush, well-packed sandy prairies, shell hash ridges, in and around abandoned truck gardens, and in gumbo glades (a local prairie on tight marly clay completely surround-

ed by pinewoods on sand).

Godfrey says that the species is "abundant on grassy roadside shoulders" in Jackson County, Florida, while Murrill (1945) reports it common in waste ground in the Gainesville area of Florida, but otherwise "rare" in the state. Chambers says that it is "not common" in open woods in Travis County, Texas. Ball reports it common on dry banks in Louisiana, while the Corrells found it in open dry gravelly soil along railroad embankments in that state. In Oklahoma it is said by Waterfall to inhabit sandy soil at the edge of water oak - green ash associations along rivers. In Texas Ferguson found it growing on the sides of sandy clay bluffs along rivers in Travis County, while Warnock says that it is "infrequent in limestone soil" in the same county and "infrequwnt around old dirt tank" in Brewster County; Cory avers that it is infrequent on highway shoulders in Culberson County; Hoisington found it along roadsides in sandy soil on a limestone base in Erath County; E. D. Schulz says that it is "very common in southern Bexar and all of Atascosa County"; and Cory reports it as frequent in sandy soil of roadsides in Kleberg County and frequent in grasslands in San Patricio County. In Reeves County it was collected in calcareous soil along depressions and ditches through the Larrea-Prosopis association by Waterfall,

and in Burnet County in red granitic soil on overgrazed savannas by Rose-Innes & Warnock. Dooley found it among mixed vegetation in sandy loam in Waller County, and Gray in "open sandy loam, full sun, with mixed grasses and weeds" in Brazos County. Warnock reports it infrequent in sandy silt in Brewster County, and Warner as "common in sandy loam, occurs in all soils" in Montgomery County. Runyon describes it as frequent in Kenedy and abundant in Hidalgo County, while in Cameron County he reports it as "frequent to abundant in open ground" and "frequent throughout this region, blooming throughout the summer months". Warnock says that it is "frequent along highways in Jackson group soil formation" in Bastrop County

In Sinaloa it was collected by Gentry in heavy clay soil of the coastal plain thorn forest. Tolstead & Cory (1946) refer to it as "an inconspicuously flowered weedy plant." Johnson describes it as frequent locally (in Runnels County) in moderately moist silty clay loam associated with Cirsium austrinum, Phalaris, and Amblyolepis setigera. Williges calls it frequent in sandy clay in San Patricio County, and Rowell says that it is "frequent in oak-hickory woodland surrounding bog" in Robertson County. Cory refers to it as "infrequent in sandy soil on lake front" in Marshall County. Ewan encountered it in vacant lots with Lepidium virginianum in partial shade of billboards. Johnston found it "in sparse mesquite brush on prairies" and on "brushy bluestem prairies in brownish-gray sand-clay loam along railroad rights-of-way."

The Lindheimer s.n. [dry prairies on the Brazos, Aug. 1843], cited below, has its spikes fasciculate-deformed; LeSueur 399 is a very pubescent form. M. S. Young says "perennial, described as annual by Lindheimer." It is also described as annual by various other collectors. Stephenson describes the flowers as "purple to white". Arsene 10242 bears some resemblance in form of the upper leaves and density of the spikes to V. litoralis H.B.K., but the pubescence on the bractlets and calyx is that of V. halei.

In regard to Lindheimer 77 [I.155], in part, cited by me as from Palo Pinto County, Texas, Dr. Geiser thinks that Lindheimer never collected in that county and that the collection must have been made in some other county — the label merely states "Dry prairies on the Brazos, July and August, 1843". Similarly, E. D. Schulz 2502, cited below from DeWitt County, has a label reading "Cuero to Gonzales" and so may actually have come from another county. The M. E. Jones 28294, cited below from Kerr County, Texas, is actually inscribed "Kerr to Bexar Co." The Edw. Palmer 242 cited below from Johnston County, Oklahoma, may have come from Atoka County according to McVaugh, Edw. Palmer Plant Explorer of the American West (1956). It is apparently Palmer's original no. Ft. Arbuckle" on the label.

E. D. Schulz points out on her no. 2812 that the fruit there is

not much longer than broad, while on her s.n. [Austin, 6-30-1920] and s.n. [Palestine, 1930] it is twice as long as broad, and on her s.n. [Galveston Island, 9/30/1938] it is about as long as wide. Lundell & Lundell 10344 is said to have the flowers "pink or lavender", but they dry to the same coloration as those on all the other specimens of their collections of this species. On the Collector undesignated s.n. [Col. Ter. 1873] specimen cited below, originally determined as V. stricta Vent., someone has added "This is a libel on Verbena stricta. It is probably a variety of V. officinalis. Dr. Engelmann has one marked V. officinalis x xutha."

Common names reported for V. halei are "blue vervain", "candelabra verbena", "European vervain", "Hale's verbena", "herb-ofthe-cross", "slender vervain", "standing verbena", "tall vervain", "vervain", and "wild verbena". Herbarium specimens have been misidentified and distributed under the names V. angustifolia Michx., V. bipinnatifida Nutt., V. canescens Kunth, V. canescens var. roemeriana (Scheele) Perry, V. carolinensis (Walt.) Gmel., V. caroliniana L., V. engelmannii Moldenke, V. hastata L., V. littoralis H.B.K., V. littoralis var. leptostachya Schau., V. menthaefolia Benth., V. neomexicana Small, V. neomexicana (A. Gray) Small, "V. neomexicana var.?", V. officinale L., V. officinalis L., V. officinallis L., V. officionalis L., V. plicata Greene, V. polystachya H.B.K., V. simplex Lehm., V. spuria L., "V. spuria var.", V. stricta Vent., V. stricta f. stricta [Wallis], V. urticaefolia L., V. urticifolia L., V. xutha Lehm., Verbina xutha Lehm., Bouchea linifolia A. Gray, Nama hispida Torr., and Phyla sp.

On the other hand, the H. S. Gentry 598m, distributed as V. halei, is V. carolina L.; R. K. King 4432 is V. litoralis H.B.K.; H. S. Gentry 1341 and K. F. Parker 8204 are V. menthaefolia Benth; S. S. White 1577 is V. neomexicana (A. Gray) Small; Garner 50, H. J. Hamby 792, E. G. Marsh 684, and Parks & Cory 16905 are V. neomexicana or its var. hirtella Perry; B. H. Warnock 8020 is V. scabra Vahl; Wolff 829 is V. xutha Lehm.; and R. M. King 4294 is Achyranthes aspera L. in the Amaranthaceae, while the E. W. Nelson 6096, annotated by Perry as "Aff. V. Halei or V. xutha" is V. pinetorum Moldenke.

Wagner & Barkley 16T322 is a mixture with V. plicata Greene.
The G. Jermy 87 and M. S. Young s.n. [4/5/18], cited below, are a mixture with V. canescens var. roemeriana; M. E. Jones s.n. [west of Uvalde, April 26, 1931] is a mixture with V. menthaefolia; C. C. Albers 33017, R. Runyon 1777, and L. F. Ward s.n. [Hearne, Sept. 11, 1877] are mixtures with V. xutha; and Tharp s.n. is a mixture with Apium leptophyllum F. Muell. The M. Shepard s.n. [June 1934] specimen in the University of Texas herbarium has the collector's

surname misspelled "Sheperd". Dr. Lundell thinks that Lundell & Lundell 10076 represents a new species.

The hybrid of V. halei with V. lasiostachys Link is xV. scorta Moldenke, with V. neomexicana (A. Gray) Small is xV. notha Moldenke, with V. officinalis L. is xV. conata Moldenke, and with V.

stricta Vent. is xV. goodmani Moldenke.

Perry (1933) cites the following 81 additional specimens not as yet seen by me: ALABAMA: County undetermined: Buckley s.n. (E); Deweys s.n. [Frascati, 11 May 1904] (G). MISSISSIPPI: Adams Co.: Shimek s.n. [Natchez, June 1898] (E). Jackson Co.: Seymour 50 (G); Skehan 46 (G), 109 (E, G). County undetermined: Hilgard s.n. [cultivated grounds near coast, May 1859] (E). LOUISIANA: Cameron Par.: S. M. Tracy 8709 (E, F, G). Jefferson Par.: Ball 344 (E, G). Natchitoches Par.: E. J. Palmer 7369 (E). Rapides Par.: J. Gregg s.n. [Alexandria, 29 Aug. 1847] (E). Saint Tammany Par.: Joor s.n. [Madisonville, 14 May 1888] (E). Parish undetermined: Hale 245 (N), s.n. (G). OKLAHOMA: Murray Co.: Stratton 62 (E). TEXAS: Bexar Co.: Berlandier 322 (G), 1592 (G); Groth 75 (G); Wilkinson S. n. [San Antonio, 1900] (E). Bowie Co.: Letterman s.n. [Texarkana] (E). Brazoria Co.: B. F. Bush 77 (E, G), 84 (E, G); E. J. Palmer 5044 (E). Brazos Co.: E. J. Palmer 11715 (E). Cameron Co.: Chandler s.n. [Rio Hondo, Sept. 1913] (E, G). Cass Co.: Eggert s.n. [near Polk, 13 June 1898] (E). Comal Co.: Lindheimer 1076 [537] (E, G). Comanche Co.: Eggert s.n. [near Comanche, 8 May 1900] (E). Dallas Co.: Eggert s.n. [North Dallas, 27 June 1899] (E); Reverchon 42 (G), 732 (E). Gillespie Co.: Jermy 203 (E). Goliad Co.: Eggert s.n. [near Goliad, 8 April 1900] (E). Gregg Co.: Eggert s.n. [near Longview, 19 April 1899] (E). Harris Co.: B. F. Bush 28 (E); Eggert s.n. [Houston, 21 April 1899] (E); E. Hall 432 (E); Lindheimer 155 [106] (E). Hood Co.: Eggert s.n. [near Granbury, 4 May 1900] (E). Hudspeth Co.: N. E. Jones 26229, in part (E). Kerr Co.: E. J. Palmer 10037 (E). Kleberg Co.: High 52 (E). LaSalle Co.: Trelease s.n. [Millett. 11 May 1897] (E). Mc Lennan Co.: Pace 22 (E). Nueces Co.: A. A. Heller 1419 (E, G); Orcutt 5867 (E). Refugio Co.: E. J. Palmer 9111 (E). San Augustine Co.: E. J. Palmer 9485 (E). Tarrant Co.: Ruth 108 (E, G). Taylor Co.: S. M. Tracy 7996 (E, F, G). Travis Co.: M. S. Young 77 (E). Uvalde Co.: E. J. Palmer 13564 (E), 33604 (E). Webb Co.: Eggert 5. n. [near Laredo, 6 April 1901] (E); K. K. Mackenzie 96 (E). Wichita Co.: Ferris & Duncan 3337 (E). Wilson Co.: E. J. Palmer 1043 (G). County undetermined: Lindheimer s.n. [Nill Creek, April 1839] (E). Galveston Island: Lindheimer s.n. [Galveston Island, May 1843] (E); S. M. Tracy 7533 (E, F, G). MEXICO: Tamaulipas: Berlandier 1511 (E, G), 3016 (E, G); Edw. Palmer 78 (E, F, G). She

says that this is "A species closely related to V. menthaefolia and V. officinalis, but readily distinguished by the diverse outline of the leaves and the somewhat more slender achenes."

In all, 927 herbarium specimens, including type material of almost all the names involved, and 3 mounted photographs and

clippings have been examined by me.

Citations: NORTH CAROLINA: Warren Co.: C. R. Bell 4366 (Hi-92963, N). SOUTH CAROLINA: Sumter Co.: A. E. Radford 20975 (Hi--131515). GEORGIA: Burke Co.: A. R. Moldenke 410 (Fg). Crawford Co.: D. E. Eyles 2928 (Sa). Turner Co.: B. B. Higgins s.n. [Ashburn, 8-5-33] (Ga). Sapelo Island (McIntosh Co.): W. H. Duncan 20214 (Au--167533, Gg--413462, Hi--106743, W--2262552). FLORIDA: Alachua Co.: M. F. Baker s.n. [May 2, 1933] (Bu); E. S. Ford s.n. [Gainesville, 25 April 1948] (Gu-30804); Janish & Janish 270 (Du-392745); Murrill s.n. [Gainesville, Apr. 15, 1938] (F1-51); F. H. Sargent 6207 (St, We); G. F. Weber s.n. [Arredonda, 4-18-28] (F1--21116); E. West s.n. [Alachua, 2 May 1934] (F1--21110). Jackson Co.: R. K. Godfrey 53168 (N, S). Leon Co.: R. K. Godfrey 56533a (Ca--95456). ALABAMA: Baldwin Co.: Ahles & Bell 7745 (Ur). Mobile Co.: Blakely s.n. [4/5/42] (Mi); G. Een s.n. [29.3.1951] (S). MISSISSIPPI: Hancock Co.: Demaree 35138 (Ss); Diener 214 (Ur); A. E. Radford 7892 (Hi--146195). Harrison Co.: Demaree 32070 (Le), 33307 (Cb, Cb, Z), 33708 (Ss); S. M. Tracy s.n. [Biloxi, 6/9/00](N). Jackson Co.: Demaree 33625 (Cb, Ss), 34896 (Ss); H. J. Jacob 1296 (Hi--196294); J. Skehan 109a (Au--180342), 1599 (Mi), s.n. [Seymour & Earle 109] (Gg--364185, Hi--59463, Ur), s. n. [Seymour & Earle 109a] (Ld), s.n. (Ur-22596). Jefferson Co.: McDougall 1291 (W--1925706). Stone Co.: Demaree 32532 (Le). Ship Island: Demaree 30585 (Hi--51390, Mi, N, Ok, St, We), 30710 (N). ARKANSAS: Calhoun Co.: Demaree 22711 (N, Sm). Drew Co.: Demaree 24933 (Sm). Hempstead Co.: Demaree 42704 (Gg). Miller Co.: Demaree 39156 (Sm, Sm), 40819 (Bm). Stone Co.: Demaree 31874 (Bm). Union Co.: D. M. Moore 510154 (St). Washington Co.: Brackett 253 [April 21, 1938] (Au). LOUISIANA: Acadia Par.: Penfound s.n. [April 21, 1940] (T1); F. W. Pennell 10201 (N). Calcasieu Par .: A. R. Moldenke 228 (Fg); Small & Wherry 11774 (N), s.n. [near Lake Charles, April 11, 1925] (W--1739114). Cameron Par.: McAtee 1953 (W--644943); S. M. Tracy 5709 (T1), 8709 (Es, N, Tr, Up--50345, W-510601). Iberia Par.: Ashbey 129 (T1). Iberville Par.: J. H. Barnhart 2825 [Herb. Barnhart 3347] (N). Jefferson Par.: C. R. Ball 344 (N, W-382729). Natchitoches Par .: Biology Class 302 no. 2163 [L. E. Fox 2163] (Nc); E. J. Palmer 7369 (Gg-182151, W-1531619). Orleans Par.: Brenning s.n. [17.6.1904] (B); Cocks s.n. [May 1903] (T1); C. Mohr s.n. [N. Orleans] (W--771864); Riddell

s.n. [New Orleans] (T). Plaquemines Par.: Langlois s.n. [28 Mai 1883] (Du--90896). Rapides Par.: Ewan 19377 (T1). Saint James Par .: Small & Alexander s.n. [near Convent, Apr. 1931] (Au, H--82843, N, N, N, We). Saint Martin Par.: Langlois s.n. [April 1880] (I). Saint Tammany Par.: Arsène 11831 (W--1033026), 12242 (W--1033052); Cocks s.n. [Slidell, Apr.] (T1).. Tangipahoa Par.: Correll & Correll 9254 (H-78937, N). Union Par.: R. Kral 8673 (Hi--151002). Vernon Par.: Cooley & Brass 3762 (T1). Parish undetermined: Hale s.n. (T-type); Riddell 1268 (N). OKLAHOMA: Atoka Co.: Hopkins, Nelson, & Nelson 1092 (Ok). Bryan Co.: C. S. Sheldon 23 (Ob-97289, W). Caddo Co.: Edw. Palmer 242 (W). Carter Co.: A. G. Payne 38 (Ok). Choctaw Co.: Waterfall 2102 (N, Ok). Jefferson Co.: Waterfall 7829 (Au-122278, Ok, St). Johnston Co.: Edw. Palmer 242 [339] (T); G. T. Robbins 2410 (Ca-966184, Ok). Latimer Co .: Hopkins & Cross 1732 (Ba, Ok) . Leflore Co .: R. Bebb 5398 (Ok, St--19588). Love Co.: E. E. Dale 824 (Ok); Nelson, Nelson, Goodman, & Waterfall 5706 (Ok); Waterfall 7254 (Ok). Marshall Co.: Alder s.n. [July 10, 1950] (Ok); Cory 58996 (St); V. E. Dowell s.n. [April 22, 1955] (Ok); G. J. Goodman 6458 (Bm, Bs, Mm, Ok, Sm); Kelting 193 (Ok); P. B. Riggs s.n. [Lake Texoma, June 20, 1952] (S); Starks s.n. [19 July 1950] (Ck). McCurtain Co.: Waterfall 8057 (Ok), 8825 (Ok, St), 10470 (St), 11829 (Au-122277, Ok, St, W--2231103). Murray Co.: Stratton 62 (St--26122). Muskogee Co.: C. S. Wallis 2219 (St). Pontotoc Co.: G. T. Robbins 2486 (Ca--966181, Ok). Pushmataha Co.: Waterfall 631 (Ok), s.n. [Kiamichi, June 3, 1937] (Ms). County undetermined: C. S. Carleton 23 [Indian Territory] (W). TEXAS: Anderson Co.: Hardin 531 (Hi-111003, Mi, W-2327763); E. G. Marsh 52 (Au-122130), 57-61 (Au--122235); E. D. Schulz s.n. [Palestine, 1930] (Wi); K. E. Smith s.n. [Palestine, 4/21/35] (Au, Bt-25428, N, St-9254); Tharp s.n. [Palestine, 4/21/35] (Du--362690). Angelina Co.: Parks & Cory 10651 (Tr). Aransas Co.: Cory 49034 (Sm); M. C. Johnston 53253,8 (Au--122164), 53253.12 (Au-122232). Archer Co.: Henon s. n. [Archer City, April 10, 1934] (Au, Au); Whitehouse 9721 (Mi, N). Atascosa Co.: Parks & Cory 19174 (Tr). Austin Co.: H. Wurzlow s.n. [Industry, 1891] (Ur). Bastrop Co.: C. C. C. Plant Project s.n. [Bastrop State Park, Nov. -- Dec. 1936] (Au); Lundell & Lundell 10344 (Ld, N); B. H. Warnock 46283 (Au), 46284 (Au, N, Ok, St); Westlund, Rowell, & Barkley 17T216 (Au, N). Dee Co.: F. A. Barkley 16T421 (Au, N, Or--55408, S, Vi); Cory 54133 (Rf); Lundell & Lundell 10051 (N). Bell Co.: Cohn T.11 (Au, N); Cohn & Barkley T.44 (Au); S. E. Wolff 2948 (Tr, Tr-16164, W-1624016), 3491 (Tr, Tr--23397), 3718 (Tr--19170); York & York 53053 (Ok). Bexar Co.: C. R. Ball 927a (W-501547); R. Bebb 2282 (Ok); Burr

49 (N); L. D. Christensen 38 (Ar--250852); Clemens & Clemens 502 (Po-69601), 969 (Po-69887), 970 (Po-69572); Groth 75 (Gg-31399, N, W--717689); Havard s.n. [San Antonio] (W--155634, W-218876); Headley s.n. [March 24, 1907] (I); G. Jermy 87, in part (W--315686), 88 (W--315687); L. G. McLean 84 (St); Meadows s.n. [April 20, 1941] (Au); Metz 62 (I), 75 (I), 3240 (Au, N); M. O. Rice s.n. [San Antonio, April 18, 1938] (St); E. D. Schulz 103 (W--1102680), 518 (N, W-1074945, Wi, Wi), 766 (N, W--1243197, Wi), s.n. [San Antonio, 4-14-1922] (Au), s.n. [Spr. 1926] (Mi), s.n. [San Antonio, 4-14-32] (Mi), s.n. [9 mi. so. San Antonio] (Wi); C. Skottsberg s.n. [San Antonio, 2/6/1935] (Go); Texas Agr. Exp. Sta. Herb. Exchange 3495 (Hp); Whelan 171 (N). Bowie Co.: Correll & Correll 12421 (Ca-907254, Sm); Eggert s.n. [13 June 1898] (N); Milligan s.n. [Dalby, May 1891] (W-504335). Brazoria Co.: B. F. Bush 77 (Hi--59461, N, S, W--336410); E. J. Palmer 5044 (Po--217659); Tharp 50-106 (Au--122217); M. S. Young s.n. [Alvin, 4/22/18] (Po--161329). Brazos Co.: Buechner s.n. [3-19-46] (Au); Chenault s.n. [April 12, 1937] (N); Cory 50627 (Ld); F. W. Gould 253 (Au--122234), 5436 (Ca--917763, S, Ur); 6644 (Ca--3738888, St); C. E. Gray 23 (Mi); H. S. Jennings s.n. [College, Mar. 31, 170] (Mi); Lake s.n. [May 1890] (Pr); Ness s.n. [Apr. 15, 1926] (Tr); E. J. Palmer 11715 (Ca--425594); L. H. Pammel s.n. [College Station, 7-1888] (Io--15349); H. B. Parks s.n. [4-13-47] (Au), s.n. [4-30-47] (Au); E. L. Reed s.n. [College Station, Oct. 1915] (N); Reeves 139 (N), 193 (N), 196 (Cs), 208 (Cs); J. N. Weaver 490 (Ld, Mi). Brewster Co.: Hinckley & Warnock 4096 (N); O. E. Sperry 583 (W--1699323); B. H. Warnock 8482 (Rf), W.538 (Au, N); Warnock & Hinckley BG.108 (Rf). Brooks Co.: C. L. Lundell 10811 (Rf, Sm); S. Williams 96 (Ok). Brown Co.: B. L. Sweet s.n. [Brownwood, 5-28-1931] (Au, Au). Burleson Co.: Herb. Univ. Texas s.n. [Lyons, Spring 1928] (Au), s.n. [Somerville, Spr. 1930] (Au). Burnet Co.: Rose-Innes & Warnock 798 (Au). Calhoun Co.: H. S. Gentry 29 (Au, N, S); Tharp s.n. [Port O'Connor, 5/19/30] (Ca--882647). Caldwell Co.: McBryde s. n. [Spr.-Sum. 131] (Au). Calhoun Co.: Trew 211 (Au--122176). Callahan Co.: Kirn s.n. [Putnam, Apr. 1926] (Wi). Cameron Co.: H. B. Cannon s.n. [Santa Rosa, Nov. 21, 1926] (Mi); M. Cannon s.n. [Santa Rosa, Feb. 9, 1927] (Mi, Mi); H. P. Chandler 7082 (Ca--174503, N, W--504573); Clover 736 (Mi); L. I. Davis s.n. [Palm Grove, Summer ! [1] (Au, Sm, St); Ewan 15551 (T1); 11. C. Johnston 253-8 (Au--122139); C. L. Lundell 10689 (N, Rf); Lundell & Lundell 8623 (Ld, Ni, N); Nealley 115/370 (W); R. Runyon 1777, in part (Rr, Rr), 2181 (Rr, Rr), 2368 (N, N), s.n. [Browns-

ville, 1930] (Hp); Tharp 1872 (Au); Tharp, Gimbrede, & Johnston 52-523 (Au--122190). Cass Co.: McClung s.n. [6-15-26] (Au). Chambers Co.: L. Barrow 31 (Au, Au); Tharp s.n. [4/7--10/36] (Au, Mi). Cherokee Co.: F. A. Barkley 13585 (Au, N); High School s.n. (Au). Coleman Co.: B. H. Warnock 46341 (Au, N). Collin Co.: Lundell & Lundell 9318 (Du--321633, N). Colorado Co.: Biology Class 19 (Au); B. H. Warnock 46430 (Au, N), 46432 (Au); Wild Flower Contest s.n. [Eagle Lake, Oct. 1930] (Au). Comal Co.: Landa 14081 (Tr); Lindheimer 537 (Ka), 1076 (Au, Br, Ca--147515, Ca--176885, Me, Me, Me, N, Ok--10360, Up--48537, W--502449). Cooke Co.: E. E. Russell s.n. [Gainesville, 5-23-1923] (Au). Culberson Co.: Cory 53037 (N); Waterfall 4496 (N, Ok, Ok). Dallas Co.: Boll s.n. [1871] (Cb); Cory 53699 (N); Hamric 21 (Au-168941); Hynes s.n. [Dallas, May 2, '25] (Au); M. E. Jones s.n. [Dallas] (Po--70677); Lundell & Lundell 8344 (Mi), 8346 (Ld, Mi), 8578 (Ld, Mi, N), 10398 (Ld, N, W-1887663), 12107 (N, Rf); J. Reverchon 732 (W); Shinners 8505 (Sm); M. B. Stephenson 200 (W--1580534); R. Van Vleet 86 (Au); Walden 13 (Nt); Wilfong 82 (Sm). Denton Co.: McCart 1977 (Au--122231), 2006 (Au, Mi, St--14716); Whitehouse 15785 (Sm). DeWitt Co.: Blanch 17 (Ok); A. H. Howell 313 (W--501462); M. Riedel s.n. [9-26-41] (Au); E. D. Schulz 2502 (W--1521151, Wi). Dimmit Co.: Alvarez, Guajardo, Salazar, & McCart 7619 (Ok); D. S. Correll 20735 (Rf); Correll & Johnston 19473 (Rf). Duval Co.: Alvarez, Guajardo, Salazar, & LicCart 7671 (Ok); Croft 119 (C, Ga), s.n. [San Diego, 1885] (Mi); R. Garza 47 (Ok); H. J. Hamby 747 (Ar-206292); M. C. Johnston 54107 (Au--122237, St). Eastland Co.: Herb. Univ. Texas s.n. [Sept. 11, 1931] (Au); Mrs. Robinson s.n. [Ranger, 9-11-31] (Au, Au). Ellis Co.: O. Sanders 19 (Mi). Erath Co.: Hoisington 27 (Au-122891), 84 (Ok), 241 (Ok). Falls Co.: A. H. Howell 362 (W-501510). Fayette Co.: Barkley, Warnock, & Tharp 46350 (Au, N); Parks & Cory 10072 (Tr--16171); Ripple 51-579 (Au--122215); B. H. Warnock 46285 (N, N, S), 46287 (Au, N, N), 46436 (Au, N, S). Frio Co.: Johnston, Tharp, & Turner 3461 (Au--122248); Lundell & Lundell 10139 (Ld, N); Parks & Cory 12748 (Tr); Wolcott & Barkley 16T265 (Au, N). Galveston Co.: R. Bebb 1131 (Ok), 1481 (Ok); Cory 51017 (N, Sm); R. L. Crockett s. n. [Apr. 22, 1944] (Au); G. L. Fisher 189 (W--1074623), s.n. [Galveston, June 6, 1920] (H-5469, Ur); C. S. Wallis 8266 (St, St). Gillespie Co.: Bryant & Bryant 3 (Ca--990129, Ok); G. Jermy 203 (W). Goliad Co.: Lundell & Lundell 10060 (Ld, Ld, N). Gonzales Co.: M. L. Hernandez 58 (Ok); Parks & Cory 5948 (Tr), 18239 (Tr); C. G. Ward 288 (St--16874). Grayson Co.: Center 8 (Nt); H. S. Gentry 50-198 (Au-122213), 185 (Au); G. Graham 35 (Au, Au), s.n. [Denison, 5/2/32] (Au); MacGarland 48 (Au); Oy-

ster s.n. [Denison, May 21, 1883] (Mi). Gregg Co.: F. W. Johnson 1766 (N); C. L. York s.n. [Fall 1937] (Au), s.n. [4-2-38] (Au). Grimes Co.: Harding 579 (St--20287); J. N. Weaver 1038 (N); T. V. Weaver 1038 (Lil). Harris Co.: L. Anderson s.n. [Sept. -- Oct. 1936] (Au); E. Boon 62 (Au, Ca--882646, N. W--2311324), 290 (Au, N); B. F. Bush 23 (N, W--386382); G. L. Fisher 20 (W--503094), s.n. [Houston, Apr. 14, 1912] (Vi), s.n. [Houston, Apr. 23, 1914] (Hp), s.n. [Houston, Apr. 9, 1931] (Bt-33827, Du--283966, Gg--222540, St--17432), s.n. [Houston, May 2, 1934] (Ew, Ms); Fitzgerald 3933 (B1--42306); E. Hall 432 (N, Po--70678, Pr, W); Hayden s.n. [Houston, 1917] (Io-100110); Joor 121 (Mi); Killip 45697 (W-2234118); Kuntze 238 (N); Penfound 1-19 (Au, Au), s.n. [April 10, 1936] (T1); Rose-Innes & Warnock 673 (Au, N); Snyder s.n. [Cypress, summer 1905] (Sd-4259), s.n. [Cypress, 1906] (Ca--185369); Thurow s.n. [Houston Heights, April 15, 1923] (Hu). Hays Co.: S. W. Stanfield s.n. [San Marcos, July 1897] (N). Henderson Co.: J. E. Brenckle 48067 (N. W-2003824). Hidalgo Co.: Clover 600 (Mi, Mi), 672 (Mi); Fleetwood 3061 (Au-180171); Lundell & Lundell 10035 (N); Painter & Barkley 14428 (Au, N); R. Rumyon 2583 (N, N). Hill Co.: H. Rogers 22 (N, Nt). Hood Co.: Blackwell 44 (Nt); Herb. Univ. Texas s.n. [Granbury, May 30, 1927] (Au); Waples School s.n. [Granbury, 5.30.27] (Au). Houston Co.: Lewis & Stripling 5293 (Nb); C. Walker 3174 (Nt). Hunt Co.: Wolff 3359 (Tr). Hutchinson Co.: M. Shepard 30 (Au), s.n. [June 1934] (Au). Jackson Co.: A. R. Moldenke 205 (Fg); Tharp & Barkley 13All4 (Au, Ml, N, N). Jasper Co.: Lundell & Lundell 10513 (Ld, N); Mrs. A. C. Rowe s.n. [Jasper, 1905] (Ms). Jefferson Co.: J. F. Brenckle 48070 (N); Kolthoff s.n. [4 Maj 1927] (S, S); C. L. Lundell 11250 (Sm). Jim Hogg Co.: Salazar & Santos 32 (Ok, Ok). Jim Wells Co.: H. J. Hamby 664 (Ar-206303); M. C. Johnston 54089 (Au--122247); Lewis & Oliver 5431 (Nb); Lundell & Lundell 10076 (N); Muenscher & Muenscher 14391 (N); Wagner & Barkley 16T320 (Au, N), 16T321 (Au, N), 16T322, in part (N). Karnes Co.: J. C. Johnson 822 (Hk, Ld). Kaufman Co.: Lundell & Lundell 8506 (Ld, Mi); F. J. Tyler s.n. [vicinity of Terrell, April 25, 1904] (W--500803). Kenedy Co.: Cory 28405 (N); S. F. Glassman 2201 (Ok); M. C. Johnston 53253.5 (Au--122244), 54276 (Au--12245), 541058 (Au--122155); Lundell & Lundell 10728 (N, Rf), 10844 (Rf), 10847 (Rf), 19844 (Ld), 19847 (N); A. R. Moldenke 195 (Fg); R. Runyon 2358 (N, N, N); Tharp 5902 (Au); Wagner & Barkley 16T392 (Au, N), 16T393 (Au, N). Kerr Co.: M. E. Jones 28294 (Gg--237867); E. J. Palmer 10037 (Bi, Du-205594, S, W--1532020). Kimble Co.: 0. Degener 5056 (N). Kleberg Co.: Benke 5417 (N); Cory 51322 (N, Sm); J. Johnson 10 (Au, Au); N. C. Johnston 53253.10 (Au--122158),

53253.11 (Au--122246), 53253.16 (Au--122241), 53253.16a (Au--122239), 53253.17 (Au--122249), 53253.17a (Au--122233), 53253.18 (Au--122252); R. Runyon 4282 (N. Sm); J. F. Sinclair s.n. [Kingsville, summer 1940] (Au); Tharp & York 51-230 (Au--122145). La Salle Co.: F. A. Barkley 17T077 (Au, Au--178081, N); Lundell & Lundell 10143 (Ld, N). Lavaca Co.: Tharp, Rogers, & York 49162 (Au--122177). Leon Co.: R. W. Long 231 (Hi-205308, N); Lundell & Lundell 10391 (Ld, N); E. C. Smith s.n. [Oakwood, 5-4-1942] (Fc); Tharp, Turner, & Johnston 54973 (Au--122174). Liberty Co.: A. R. Moldenke 220 (Fg). Llano Co.: G. L. Fisher s.n. [Bluffton, May 31, 1936] (Ms); M. E. Jones 29187 (Bm, Po--199866); Kelting 38 (Ok); Lee, Barkley, & Tharp 47282 (Au, N); Lundell & Lundell 9040 (Ld, Mi); Parks & Cory 6280 (Tr); M. E. Watts 28 (Au); S. E. Wolff 3067 (Tr--16165, Tr--22251, W--1624021), 3825 (Tr--16166). Matagorda Co.: Cory 51091 (Sm); Tharp 1403 (Au); Walter 51 (Au); B. H. Warnock 46308 (Au, N), 46312 (Au, N). Maverick Co.: M. E. Jones 28295 (Po--187970). McLennan Co.: L. D. Smith 388 (St), 847 (Au--122170); C. L. York 46087, in part (Au), 46100, in part (Au). Milam Co.: Lundell & Lundell 10374 (Ld, N); Wolff 3620 (Tr). Montague Co.: McCart 1634 (Au, N, Nt). Montgomery Co.: Warner 66 (Hu). Morris Co.: Correll, Johnston, & Edwin 22158 (Ld). Nacogdoches Co.: W. H. Lewis 5276 (Nb); Tharp & Brown 53-51 (Au--122078). Navarro Co.: Cory 51533 (Sm); Mitcham 42 (Au); Purdue 7 (Au). Nueces Co.: A. A. Heller 1419 (C, Ca--104876, Mm-15397, W-213687); Tharp 5603 (Au, W--1468816); S. M. Tracy s.n. [3/14/05] (Tr--16172), s.n. [Cornus Christi, 3-31-1905] (Tr--8120); B. H. Warnock 20999 (Au). Orange Co.: J. K. Small s.n. [April 11, 1925] (F1--29058); Small & Wherry 11801 (N); Wild Wood Club s.n. [Orange, Apr. 25, 1931] (Au); M. S. Young 167 (Ur), 253 (Au). Palo Pinto Co.: Culwell & Timmons 3068 (Nt); J. W. Gillespie 5214 (Du--210195); Lindheimer 77 [I.155] (E--118196), 155 (Ca--248432). Parker Co.: C. L. York 7 (Au--122129). Pecos Co.: B. H. Warnock 46166 (Au). Polk Co.: Girvin s.n. [April 12, 1940] (Au, Au); Tharp s.n. [7-23-39] (Au), s.n. [4-12-42] (Au); Tharp, Turner, & Johnston 54704 (Au-122126). Reeves Co.: Waterfall 4388 (N, Ok, Ok, Tu-31202). Refugio Co.: Lundell & Lundell 10856 (N, Rf); A. R. Moldenke 196 (Fg); E. J. Palmer 9111 (Bi, Du-205599, S, W--1531877). Robertson Co.: Rowell 8029 (Mi, N); W. H. Seaman s.n. [Hearne, 11-9-1877] (W--787347); J. B. Walker 75 (W-2133168); L. F. Ward s.n. [Hearne, Sept. 11, 1877] (W--147568); S. E. Wolff 458 (W--1623883). Runnels Co.: J. C. Johnson 650 (Au--122214). Rusk Co.: C. E. Porter 51-1830 (Au-122216). San Augustine Co.: E. J. Palmer 9485 (Bi, Du-205591, S, W-1531929). San Patricio Co.: Cory 51259 (Ca-754334, N, Sm);

Lundell & Lundell 10082 (N); McKelvey 1725 (W--1581388); E. D. Schulz 855 (Wi), 2812 (Wi, Wi), s.n. [Aransas Pass, May 1926] (Wi); Tharp s.n. [Sinton prairie, 3/23/31] (Au); Tharp & Brown 48-203 (Au-122179, N, St), 48-203a (St); Williges 4-W (Au--175509), 15 (Au--175628), 305 (Au--179712); Wolcott & Barkley 16T405 (Au, N). Shelby Co.: Correll, Johnston, & Edwin 22223 (Ld). Smith Co.: H. E. Moore Jr. 529 (W-1897357). Starr Co.: Lundell & Lundell 9924 (Ld, N). Tarrant Co.: F. C. Gates 19133 (Ka-89647); Killian 6953 (Au, W-1465340); Lundell & Lundell 8522 (Ld, Mi, N); Ruth 84 (Au), 93 (Ll), 108 (Cm, Io--113613, Ka, N, N, N, Up, Ur, W--501768), s.n. [Fort Worth, June 5, 1909] (Po--267665); Wilczek 36 (Cb). Taylor Co.: S. M. Tracy 7996 (Au, Cm, Es, N, N--photo, Vt. W--500366, Z--photo). Terrell Co.: Farr s. n. [Sanderson, May 8, 1911] (Up-52680). Throckmorton Co.: Wild Flower Contest s.n. [Throckmorton, April 1935] (Au). Tom Green Co.: C. Smith 151 (Ok). Travis Co.: C. C. Albers 33016 (Au); Armer 5385 (Au, Au, W-1438998), s.n. [Austin, 4.23.29] (Go); Barkley & Rowell 7057 (Au, II); Biltmore Herb. 14787a (S); Bogusch s.n. [March 26, 1926] (Ob--50791); L. C. Chambers 3033 (W--697808); Cohn & Barkley 13253 (Au, Ca--882529); Collector undesignated s.n. (Au); A. M. Ferguson s.n. [4/27/01] (Au); Lundell & Lundell 10308 (Ld, N, W-1888931); Mahler 1267 (St); McWilliams 4651 (Au); E. D. Schulz s.n. [Austin, 6-30-1920] (Wi); Tharp 1529 (Au), 2818 (W--1221373), s.n. [Austin, 4/23/29] (Au, N, N, Pl-151577, Vi, We), s.n. [Austin, 5/2/35] (Au, Bt--25424, St--9253), s.n. [Austin, 5/9/35] (Au, Du-362688, St--9252), s.n. [Deep Eddy, 4-26-36] (Au), s.n. [Austin, 7/15/38] (Au, Au); B. H. Warnock 45-5 (Au), 46104 (Au, Ok, S, Vi); Werquithin s.n. [Austin, 5/14/15] (Io--102277); Westler J. Y. T. S. s.n. [Austin, May 1930] (Mi); Wheeler, Buck, & Barkley 16T248 (Au, N); M. S. Young 77 (Au), S. n. [4/5/18] (Au). Tyler Co.: Tharp, Turner, & Johnston 54840 (Au-122125). Uvalde Co.: M. E. Jones s.n. [west of Uvalde, April 26, 1931] (Ca--479073, Du--230896, Po--187973); C. L. Lundell 10965 (N, Rf); E. J. Palmer 13564 (B, W--1603487), 33604 (N); Small & Wherry 11998 (N). Val Verde Co.: Cory s.n. [Del Rio, 3-18-1927] (Tr); M. E. Jones 26229, in part (Gg--237870, I, La, Mn-22066; Po--178355); A. R. Moldenke 172 (Fg); Parks, Warnock, & Turner 254 (Rf, Rf); B. H. Warnock 11361 (Rf); Warnock & Cameron 9893 (Rf). Van Zandt Co.: Beckham s.n. [Wills Point, 1930] (Au); Ezell 23 (Au), 5699 (W-1468815); B. Williams 10 (Nt). Victoria Co.: F. L. Lewton 37 (Ar--271653), 763 (Ar--271747); Maxon 3822 (W-500447); McVaugh 12422 (Mi); A. R. Moldenke 203 (Fg). Walker Co.: Parks & Cory 7883 (Tr), 20238 (Tr); Tharp s.n. [6/11/35] (Sm). Waller Co.: Dooley 2 (Au, N); Thurow s.n. [May 10th, 1890]

(Hu). Washington Co.: C. C. Albers 33017, in part (Au); Brackett 253 [March 29, 1938] (Au), s.n. [April 21, 1939] (Au); U. Lehman [Brenham, 4-21-34] (Au). Webb Co.: Cantu, Villa, & McCart 74 (Ok); K. K. Mackenzie 96 (N); McCart 7242 (Ok, Ok); Perkins & Hall 2627, in part (Po--256897). Wharton Co.: A. R. Moldenke 209 (Fg); B. H. Warnock 46421 (Au, N). Wichita Co.: Ferris & Duncan 3337 (Du-125422, Gg--31404, N); Whitehouse 10474 (Mi, N). Willacy Co.: J. F. Brenckle 47-361 (N); Cory 51489 (Sm); Davis & Johnston 53253. 22 (Au--122250), 53253.23 (Au--122251); M. C. Johnston 53253.9 (Au--122161), 54164 (Au--122243); Lewis & Oliver 5424 (Nb); Lundell & Lundell 8786 (Ld, Mi, N); Tharp s.n. [Redfish Bay, Mar. 5, 1934] (Au), s.n. [Nov. 30, 1940] (Vi). Wilson Co.: Thompson & Graham 52 (Au--123189). Wise Co.: McCart 1647 (N, Nt). Young Co.: Correll & Johnston 22127 (Ld); S. Hayes 606 (Ms, N); Parks & Cory 13145 (Tr); Whitehouse 15324 (N). County undetermined: Belfrage s.n. [Texas, 1860] (S); Berlandier 3011 (Cb), 3016 (W); Black 38-5940 (Be--46632); Collector undesignated s.n. (Nt); Herb. Univ. Texas s.n. [April 23, 1929] (Au); A. M. Hildebrandt s.n. (W--329997); Lindheimer I.155 (W-1870924), s.n. [Dry prairies on the Brazos, Aug. 1843] (E--118198), s.n. [Southern Texas, 1849--51] (N), s.n. [Texas] (W--771866); E. Meyer s.n. [Texas, 1844] (W--264612); Edw. Palmer 34 [Yaqui River] (W), 1043 [sw. Texas] (W, W-1323112); Reeves 204 (Cs), 207 (Cs); G. Sims 42 (Ok--10368); Tharp s.n. (Au); L. F. Ward s.n. [Texas, Sept. 11, 1877] (W--147582). Dunham Island: Tharp 1622 (Au, Au). El Toro Island: Tharp 49098 (St, W-1972910), 49236 (St). Galveston Island: E. D. Schulz s.n. [Galveston Island, 7/30/1938] (Wi); S. M. Tracy 7533 (Au, Cm, Es, Io--48866, N, W--442190). Green Island: Tharp 1200 (Au). Mustang Island: H. Hildebrand 86 (Au-122173, St). NEW MEXICO: Otero Co.: M. E. Jones 26229 (Du--235292). ARIZONA: Pinal Co.: Goodding & Lusher 186-45 (N, Or--55219); Peebles & Harrison 4224 (La). MEXICO: Chihuahua: Pringle s.n. [Valley, Ortiz, Apr. 11, 1887] (Gg--421277, N, St). Coahuila: G. L. Fisher 4416 (Ew, Ew, N), 4416b (Ew, Gg--353404); E. G. Marsh 1625 (St), 2128 (St). Durango: Waterfall & Wallis 13371 (St). Nuevo León: Arsène s.n. [Sta. Catarina, 7-1911] (B, N); Frye & Frye 2474 (Se--65787, W--1791011). Querétaro: Agniel s.n. [Arsène 10242] (Ur). Sinaloa: H. S. Gentry 7011 (W--1945099). Sonora: K. F. Parker 8204 (Ca-993702, Gg--382182). Tamaulipas: Berlandier 1511 (T), 3016 (Cb); Brenning s.n. [Tampico, 21.5.1904] (B); Graham & Johnston 4710b (Au-174987); LeSueur 399 (Au, Fs); Lewis & Oliver 5422 (Nb); Edw. Palmer 78 (Bm, Gg-31397, N, W--463015). Vera Cruz: L. I. Davis s.n. [near Tecolutla, 6-24-47] (Au--123240); Rutten & Rutten-Pekelharing 478 (Ut--8100b). LOCAL

ITY OF COLLECTION UNDETERMINED: Collector undesignated s.n. [Col. Ter., 1875] (Up--17113). MOUNTED CLIPPINGS: Bull. Torrey Bot. Club 25: 617. 1898 (W).

VERBENA HALEI f. ALBIFLORA L. I. Davis, Nature Leaflet [Lower Rio

Grande Valley Nat. Club] 2: [4]. 1945.

Bibliography: L. I. Davis, Nature Leaflet [Lower Rio Grande Valley Nat. Club] 2: [4]. 1945; Moldenke, Am. Journ. Bot. 32: 610. 1945; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 24 & 198. 1949; Moldenke, Résumé 29 & 471. 1959.

This form differs from the typical form of the species in hav-

ing white corollas.

The type of the form was collected by L. Irby Davis near Falfurrias, Brooks County, Texas, in June, 1942, and is deposited in the herbarium of the University of Texas at Austin. The collector states that other specimens of this form have been gathered in the Rio Grande Delta region of Hidalgo County, Texas. As yet I have not seen any material of it.

VERBENA HALEI f. ROSEIFLORA (Benke) Moldenke, Phytologia 1: 459.

Synonymy: Verbena officinalis f. roseiflora Benke, Rhodora 35: 45. 1933. Verbena officinalis f. rosea Blackwell ex Moldenke,

Résumé Suppl. 3: 40, in syn. 1962.

Bibliography: Benke, Rhodora 35: 45. 1933; Moldenke, Phytologia 1: 459 (1940) and 1: 511. 1941; Moldenke, Suppl. List Invalid Names 9. 1941; Moldenke in Lundell, Fl. Texas 3 (1): 16 & 23. 1942; Moldenke, Alph. List Invalid Names 49. 1942; Moldenke, Known Geogr. Distrib. Verbenac. [ed. 1], 13 & 101. 1942; Moldenke, Alph. List Cit. 1: 43 (1946) and h: 1129. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 24 & 198. 1949; Moldenke, Résumé 29, 371, & 471. 1959; Moldenke, Résumé Suppl. 3: 40. 1962.

This form differs from the typical form of the species only in having the corollas pink, purplish-pink, deep-rose, or bright-rose

in color.

The type of this form was collected by Hermann Conrad Benke (no. 5418) at Kingsberg, Kleberg County, Texas, on March 28, 1930, and is deposited in the herbarium of the Chicago Natural History Duseum. Although known thus far only from three collections, it is probable that this color form is coextensive in range with the typical form of the species and has an equally long blooming period. It has been found in sandy meadows, blooming from March to May. Herbarium material has been misidentified and distributed as V. halei Small and V. officinalis L. In all, 5 herbarium specimens, including the type collection, have been examined by me.

Citations: TEXAS: Goliad Co.: C. B. Williams 32 (Au). Hood Co.:

Blackwell 81 (Au, N, Nt). Kleberg Co.: Benke 5418 (W--1571128--

lsotype).

VERBENA HARBISONII Moldenke, Phytologia 1: 438--439. 1940. Eibliography: Moldenke, Phytologia 1: 438--439 (1940) and 1: 511. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 18 & 101. 1942; Moldenke, Alph. List Cit. 1: 256. 1946; Hill & Salisb., Ind. Kew. Suppl. 10: 242. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 63. 1948; Moldenke, Alph. List Cit. 2: 488 (1948) and 4: 1242. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2],

33 & 198. 1949; Moldenke, Résumé 39 & 472. 1959.

Herb; stems erect, slender, rather acutely tetragonal, ridged, rather densely hirsutulous-pubescent with short, divergent, canescent hairs; branches similar but usually more densely canescent hirsutulous, ascending, short; intermodes on stems usually elongated, 4--8 cm. long, more abbreviated on the branches; nodes plainly annulate; leaves decussate-opposite; petioles 3--10 mm. long, winged-margined, densely hirsutulous-pubescent with canescent hairs; leaf-blades chartaceous, uniformly green on both surfaces, 2--5.5 cm. long, 2--5 cm. wide, the larger ones deeply 3parted practically to the base, the divisions lanceolate in outline, deeply and irregularly pinnatisect, all the lobes sharply acute at the apex, the margins slightly revolute, the lateral divisions widely divergent, the uppermost leaves much reduced, with linear divisions, all hirsutulous-pubescent above and on the venation beneath; venation slightly impressed above, prominent beneath; inflorescence spicate, rather long-pedunculate, terminating the upper branchlets; peduncles slender, acutely tetragonal, densely canescent-hirsutulous, 2--5.5 cm. long; spikes oblong, 1--2.5 cm. long, about 1.5 cm. wide, very densely many-flowered; bractlets lanceolate, equaling the calyx, 5--6 mm. long, about 1 mm. wide at the base, long-attenuate to a setaceous apex, densely hirsutulous with short hairs; calyx membranous, cylindric, its tube about 5 mm. long, 0.9 mm. wide at the base and 2.2 mm. wide at the apex, densely short-pubescent with spreading white hairs, its rim 5-lobed, the lobes about 2.5 mm. long, setulose, densely pubescent; corolla hypocrateriform, clabrous on the outside, its tube about 6.8 mm. long, the limb about 5 mm. in diameter, the lobes small, about 2 mm. long and wide, rounded and bifid at the anex; stamens 4, didynamous, inserted about 2.4 and 3.4 mm. below the mouth of the corolla-tube, included; filaments filiform, very short, 0.2--0.4 mm. long; anthers about 0.9 mm. long and 0.7 mm. wide, unappendaged; style capillary, about 4.9 mm. long, glabrows; ovary oblong, about 1.4 mm. long and 0.7 mm. wide, glabrous.

The type of this species was collected by Charles Francis Harbison — in whose honor it is named — at Agua del Refugio, Baja California, Mexico, on April 1, 1935, and is eposited in the herbarium of the San Diego Society of Natural Histroy at San Diego, California. The species is quite distinct from all the other known species of this region, although its affinity is apparently with V. setacea Perry, which it resembles. Its most obvious characters are its long-pedunculate, densely-flowered, oblong spikes, elongate setaceous bractlets, and deeply 3-parted leaves whose lobes are all plainly acute at the apex. The type collection is sometimes regarded as Harbison 11303, but this number seems to be

a herbarium number rather than the collector's number. A note on the label of the type says "material from same lot determined as Verbena sp. by Ira L. Wiggins." Ferris identified the Dudley Herbarium specimen as V. setacea Perry. In all, 4 herbarium specimens, including the type, and 2 mounted photographs have been examined by me.

Citations: MEXICO: Baja California: C. F. Harbison s.n. [Agua del Refugio, April 1, 1935] (Du-244976-isotype, Gg-328000-isotype, N-isotype, N-photo of type, Sd-11808-type, Z-photo

of type).

VERBENA HASSLERANA Briq. in Chod. & Hassler, Bull. Herb. Boiss.,

sér. 2, 4: 1056. 1904.

Synonymy: Verbena phlogiflora Chod. apud Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1056, in syn. 1904 [not V. phlogiflora Cham., 1832, nor Cham. & Schlecht., 1959]. Verbena hassleriana Briq. apud Prain, Ind. Kew. Suppl. 3: 187, sphalm. 1908. Verbena hassleri Briq. ex Moldenke, Suppl. List Invalid Names 8, in syn. 1941. Verbena paraguariensis var. latiuscula Briq. ex Moldenke, Phytologia 2: 475, hyponym. 1948. Verbena hasleriana Briq. ex Moldenke, Résumé Suppl. 3: 38, in syn. 1962.

Bibliography: Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1056. 1904; Briq. in Chod. & Hassler, Plant. Hassler. 10: 478. 1904; Prain, Ind. Kew. Suppl. 3: 187. 1908; Moldenke,

Ser. 2, 4: 1056. 1904; Briq. in Chod. & Hassler, Bull. Hels. Bollows, Sér. 2, 4: 1056. 1904; Briq. in Chod. & Hassler, Plant. Hassler. 10: 478. 1904; Prain, Ind. Kew. Suppl. 3: 187. 1908; Moldenke, Suppl. List Invalid Names 8 & 9. 1941; Moldenke, Lilloa 6: 330 (1941) and 8: 430. 1942; Moldenke, Alph. List Invalid Names 47 & 49. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 41 & 101. 1942; Moldenke, Lilloa 10: 385. 1944; Moldenke, Phytologia 2: 475. 1948; Moldenke, Alph. List Cit. 1: 263. 1946; H. N. & A. L. Moldenke, Pl. Life 2: 63. 1948; Moldenke, Castanea 13: 117--119. 1948; Moldenke, Alph. List Cit. 2: 599 (1948), 3: 666, 693, & 916 (1949), and 4: 1237 & 1249. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 94, 99, 106, & 198. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 13. 1949; Stellfeld, Trib. Farmac. 19 (10): 166. 1951; Moldenke, Phytologia 4: 188. 1953; Angely, Pl. Paran. 7: 7. 1957; Moldenke, Résumé 110, 118, 127, 365, 371, 372, 417, & 472. 1959; Angely, Fl. Paran. 16: 78 (1960) and 17: 46. 1961; Moldenke, Résumé Suppl. 3: 38.

Perennial herb. to 1 m. tall, robust; stems tall, green, plainly tetragonal, branched; branches ascending, retrorsely scabridulous; middle internodes 2-6 cm. long; leaves decussate-opposite; petioles winged above; leaf-blades oblong or ovate-oblong, the larger ones to 7 cm. long and 3 cm. wide, sometimes smaller and narrower, acute or subacute at the apex, convex on the margins below the middle, membranous, green on both surfaces, rounded-attenuate into the petiole at the base, rather coarsely doubly crenate, the upper teeth to 5 mm. long and 2-5 mm. apart, sometimes much smaller, scabridulous on both surfaces with small rigid antrorse hairs; venation somewhat prominulent and more ru-

gose beneath; inflorescence terminal, spicate, abbreviated, about 3 cm. long, more or less shortly pedunculate, congested; bractlets lanceolate-subulate, very long, to 1.5 cm. long, subequaling the calyx, beautifully spreading pilose-ciliate; calyx long-tubular, urceolate after anthesis, about 1.5 cm. long, rather rigid spreading-ciliate, especially on the veins, the teeth unequal, the 3 posterior ones shorter, about 3 mm. long, subulate, the posterior (lower) 2 very long filiform-subulate, more than 5 mm. in length; corolla hypocrateriform, varying from violet to rose, bluish-rose, or bluish-red, its tube cylindric, surpassing the calyx-teeth by only about 2-3 mm., the limb spreading, about 1 cm. wide, the lobes obcordate; stamens included; style included, incrassate toward the apex and shortly bifid, after anthesis surpassing the calyx-teeth by about 5 mm.

The species is based on three collections by Emil Hassler — in whose honor it is named. These collections are no. 3550, from a swamp at Tucangua, Paraguay, collected in November, 1900, and nos. 6401 and 6464, from a swamp near Tobaty, Paraguay, collected in September, 1900, all deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva. V. paraguariensis var. latiuscula seems to have been based by Briquet on Lindman A. 3905 from Paraguari, collected in October, 1893, and later redetermined by him as V. platensis Spreng. Briquet says: "Le V. hasslerana appartient au groupe de V. megapotamica, chamaedryfolia, platensis etc. comme affinités générales, mais il s'écarte de toutes les espèces connues de ce groupe par son indument scabre, ses bractées aussi longues que les calices et ses dents calicinales longuement subulées-filiformes. C'est une type de premier ordre."

The species inhabits bogs and swamps, campos, and land adjacent to rivers, from 750 to 1200 meters altitude. Jörgensen says that it is common in thickets in shrubby marshlands. It has been collected in anthesis from September to December and in February. A common name for it is "flor de vovia". In all, 20 herbarium specimens, including type material of all the names involved,

and 2 mounted photographs have been examined by me.

Citations: BRAZII: Rio Grande do Sul: Rambo 52102 (S). Santa Catarina: Smith & Reitz 8876 (Ok, W-2251458), 8933 (W-2251470, Z), 11392 (W-2249376). PARAGUAY: Hassler 6464 [Macbride photos 24685] (Ca-944360-cotype, Kr-photo of cotype, N-cotype, N-photo of cotype, S-cotype, T1-cotype, W-2055198-cotype); Jörgensen 3769, in part (Du-197903, W-1483663); Lindman A.3905 (S). ARGENTINA: Misiones: Gruner 1044 [Herb. Osten 23181] (N, Ug); Ruiz Huidobro 4753 (Cg-353220, N); G. J. Schwarz 3440 (N, S).

VERBENA HASSLERANA var. OVATIFOLIA Moldenke, Phytologia 6: 330.

1958.

Bibliography: Waldenke Phytologia 6: 330.

Bibliography: Moldenke, Phytologia 6: 330. 1958; Moldenke, Ré-

sumé 110 & 472. 1959.

This variety differs from the typical form of the species in having its leaf-blades much smaller, ovate, 1.8--3.3 cm. long, 0.6--2 cm. wide, and the filiform petioles only 4--5 mm. long.

The type of the variety was collected by Lyman Bradford Smith and R. Klein (no. 3478) in ruderal situations at Rio Negrinho, municipality of Rio Negrinho, Santa Catarina, Brazil, on December 8, 1956, and is deposited in my personal herbarium at Yonkers, New York. The plant has also been found on riverbanks, and appears to grow at altitudes of 900 to 1200 meters. It has been collected in anthesis in December and February. Smith & Klein 11638 is a mixture with something non-verbenaceous.

In all, 7 herbarium specimens, including the type, have been

examined by me.

Citations: BRAZIL: Santa Catarina: Smith & Klein 8478 (W-2251403-isotype, Z-type), 11638, in part (Ok, W-2251793); Smith & Reitz 10203 (Ok, W-2251662); Smith, Reitz, & Sufridini 9495 (W-2249361).

VERBENA HASTATA L., Hort. Upsal. 8 (1748); Sp. Pl., ed. 1, 20. 1753.

Symonymy: Verbena americana, urticae foliis angustioribus, flore coeruleo P. Herm., Hort. Acad. Lugd.-Bat. Cat. 699. 1687. Verbena urticae fol. angustiore flore coerul. Herm. apud Rivin., Introd. Gen. Remherb. [24], pl. [57]. 1690. Verbena americana urticae foliis angustioribus, spica multiplici flore caeruleo Herm., Fl. Lugd.-Bat. 54--55. 1690. Verbena americana urticae foliis angustioribus, spica multiplici floribus purpureis [as "Eadem floribus purpureis"] Herm., Fl. Lugd.-Dat. 55. 1690. Verbena altissima americana spica multiplici, urticae foliis angustis, floribus caeruleis Herm., Parad. Bat., ed. 1, 242. 1698. Verbena altissima americana Herm., Parad. Bat., ed. 1, pl. 242. 1698. Verbena americana urticae foliis angustioribus, flore caeruleo Moris., Pl. Hist. Univ. Oxon. 3: "408" [=418]. 1699. Verbena altissima americana, spica multiplici, urticae foliis angustis, floribus coeruleis Herm. apud Ray, Hist. Plant. 3: Suppl. 286. 1704. Verbena altissima americana spica multiplici, urticae foliis angustis, floribus coeruleis Herm., Parad. Bat., ed. 2, 242. 1705. Verbena altissima, americana Herm. apud Boerh., Ind. Plant. Hort. Acad. Lugd., ed. 1, 75. 1710. Verbena; americana; altissima; urticae foliis angustioribus; spicis brevioribus; floribus caeruleis Herm. apud Boerh., Ind. Alt. Plant. Hort. Acad. Lugd., ed. 2, 1: 186. 1720. Verbena, americana, altissima Herm. apud Boerh., Ind. Alt. Plant. Hort. Acad. Lugd., ed. 2, 1: 186, in syn. 1720. Verbena; americana; altissima; urticae foliis angustioribus; spicis brevioribus; floribus pur-

pureis Herm. apud Boerh., Ind. Alt. Plant. Hort. Acad. Lugd., ed. 2, 1: 186. 1720. Verbena americana altissima, urticae foliis angustioribus, spicis brevibus. floribus caeruleis Boerh. apud L., Hort. Cliff. 11, in syn. 1737. Verbena foliis lanceolatis serratis, spicis filiformibus paniculatis Royen, Fl. Leyd. Prod. 727. 1740. Verbena americana altissima, urticae foliis angustioribus, spicis brevioribus, floribus caeruleis Boerh. apud A. van Royen, Fl. Leyd. Prod. 327, in syn. 1740. Verbena tetrandra, spicis longis acuminatis, foliis hastatis L., Hort. Ups. 8. 1748. Verbena foliis lanceolatis serratis, spicibus filiformibus paniculatis Ray apud L., Hort. Ups. 8, in syn. 1748. Verbena americana altissima, spica multiplici, urticae foliis angustis, floribus caeruleis Ray apud L., Hort. Ups. 8, in syn. 1748. Verbena americana altissima, urticae foliis angustis, spicis brevioribus, floribus purpureis Boerh. apud L., Hort. Ups. 8. 1748. Verbena americana altissima, spici multiplici, urticaefoliis angustis, floribus caeruleis Herm. ex L., Sp. Pl., ed. 1, 20, in syn. 1753. Verbena americana altissima, spica multiplici, urticae foliis angustis, floribus coeruleis Ray apud J. F. Gronov., Fl. Virg., ed. 2, 4, in syn. 1762. Verbena caule triangulo striato, spica nuda longissima multiplici: floribus saturate violaceis...etc., etc. etc. J. F. Gronov., Fl. Virg., ed. 2, 4. 1762. Verbena pinnatifida Lam., Tabl. Encycl. Méth. [Illustr. Gen.] 1: 57. 1791 [not V. pinnatifida M. E. Jones, 1941, nor Nutt., 1941, nor Schau., 1895]. Verbena paniculata Lam., Encycl. Méth. Bot. 8: 548. 1808. Verbena americana, altissima, spica multiplici, urticaefoliis angustis, floribus caeruleis Herm. apud Poir. in Lam., Encycl. Méth. Bot. 8: 546, in syn. 1808. Verbena hastata, erecta, foliis lanceolatis; sensim angustatis, acutissimis, inciso-serratis; spicis paniculatis, linearibus subimbricatis Michx. apud Poir. in Lam., Encycl. Méth. Bot. 8: 546, in syn. 1803. Verbena hastata, tetrandra, spicis longis, acuminatis; foliis hastatis L. apud Poir. in Lam., Encycl. Méth. Bot. 8: 546, in syn. 1808. Verbena (pinnatifida), spicis filiformibus; foliis inciso-pinnatifidis, grosse serratis Lam. apud Poir. in Lam., Encycl. Meth. Bot. 8: 546, in syn. 1808. Verbena spicis filiformibus, paniculatis; foliis lanceolatis, grosse serratis, indivisis Lam. apud Poir. in Lam., Encycl. Méth. Bot. 8: 546, in syn. 1808. Verbena spicis paniculatis, foliis lanceolatis, acuminatis, acute serratis, basi inciso-hastatis Lam. apud Poir. in Lam., Encycl. Meth. Bot. 8: 546, in syn. 1808. Verbena hastata & Poir. in Lam., Encycl. Meth. Bot. 8: 546. 1808. Verbena tetrandra, spicis longis acuminatis, fol. hastatis L. apud H. E. Richter, Cod. Bot. Linn. 35. 1835. Verbena fol. lanc. serratis, spicis filif. paniculatis Royen apud H. E. Richter, Cod.